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SIBILITY

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approach

OCTOBER 1961
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CONTENTS

DEPARTMENTS

APPROACH, The Naval Aviation Safety Review

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Good duty in the Navy depends primarily upon the Skipper. When we get our orders, the first question we usually ask is, how's the Skipper? The location of the place or the type of the ship is secondary. It might be sunny California or lush, verdant Hawaii, but if the Skipper is a Captain Bligh, then we'll immediately break out the crying towel and start looking for sympathy chits.

A good Skipper is not a soft man who runs a sloppy ship. He is not an indifferent man, who locks himself in his cabin and lets his subordinates take over. He is not an indulgent man who throws away the book and follows the motto, "Boys will be boys." A good Skipper is a just man who leads with a firm, but kindly hand. Who knows when to be generous and when to be strict. He will not tolerate mediocrity in the profession of arms, anymore than a coach will tolerate a dumb quarterback or an indifferent tackle.

There are some Skippers for whom the men would willingly jump over the side. Then, too, there are some Skippers whom the men would willingly shove over the side.

Leadership involves a knowledge of self and the treatment of others as individuals. It is not necessary for the Commanding Officer to know all hands by their first names, but it is necessary that he know that they are human beings and not a herd of cattle. They will respond in proportion to the interest he takes in them as individuals of a team. They will be conscious of their responsibilities in the same degree as their Captain shows his confidence and trust in them. Men are naturally hero worshipers.

Young men have always knocked themselves out for a tough coach providing they knew he was not a faker or fourflusher or a fraud. Young men are keen to penetrate and to appraise the qualifications of a leader. In the Navy, by virtue of length of service, most officers get command positions. They are directly charged with the responsibility for morale of those under them. They will be blessed or cursed by those who follow them. Their reputation will be passed along as able leaders under whom it was a privilege to serve or frustrated characters who belong in the pages of the Caine Mutiny.

When you take off the uniform for the last time, will the Navy be relieved or sad because you no longer command?—*Written by the late VADM James H. Flatley while he was Ass't Chief of Staff, ComNavAirLant.*

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LETTERS TO THE EDITOR

Caption Writers

San Diego—Re your picture on page 38, APPROACH, July '61: it looks like they're having a convention in Fly 1. We recommend that the cat officer roll down his sleeves (assuming that he might become involved in fire fighting), kick off all sightseers other than his talker, and move essential handling personnel aft before someone gets hurt or causes a premature launch by waving to a friend in the catwalk (who shouldn't be there, either). Note both cats in use—these people are all surrounded by DANGER.

PETE COSTELLO, LCDR
(ex-cat officer)
GEORGE CARLSON, LCDR
(ex-flight deck officer)
VP-31

● **Concur**

Beware of the "Minor Discrepancy"

Quonset Point—Because of its nature, work on a minor discrepancy is quite often performed by a striker. The striker, a man new to the aviation business, is going through the period when his work habits are being formed. Since the work he performs is, in a majority of cases minor in nature, it does not always get the same degree of supervision or inspection a major discrepancy will get. Improper supervision and incomplete inspection of a striker's work can result in mistakes. Supervisors are reminded that a striker must have proper supervision to enhance his learning and to form the habit of quality workmanship. Inspectors are cautioned that minor discrepancies require the same thoroughness and completeness of inspection that a major discrepancy requires. It has been said that "*small details overlooked on the ground have caused big problems in the air.*"

A. A. DEGENNARO, LCDR
VAW-12
Maint. Department

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, U. S. Naval Aviation Safety Center, NAS Norfolk, Va. Views expressed are those of the writers and do not imply endorsement by the U. S. Naval Aviation Safety Center.

Curiosity Can Kill

VP-49—On the cover of your February issue you show an A3D coming in for a barrier landing. Another A3D is spotted to the right of the barrier, behind the mirror, (Side No. 21). . . . If you'll carefully notice there is a man in the cockpit. The point—should the man be in the cockpit with a plane coming in for a landing such as the one by the A3D? Had the plane coming in (No. 19) for the barrier landing, bounced, missed, or so many other things that could have gone wrong and hit the spotted aircraft *what would have happened???*

"Curiosity killed the cat and this cat could have easily had it"!

ANYMOUSE

● **You're so right. It appears that this gent was asking for it.**

For Safety P.O.s

About this time of the year I usually take a moment to write a few letters to my good friends, the time when I remember all good things and indulge myself to the extent of getting a little sentimental.

It is a blustery evening, but here in my den its cozy and comfortable. I'm sitting before a nice open fire with my typewriter, sort of half listening to the radio and slowly sipping a nice, very dry double martini. I only wish you were here, and since you are not, the least I can do is to toast your health and happiness. So time out, old pal . . . while I bend my elbow to you.

A good safety officer attached to a top command, and incidentally responsible for the safety record of 28 squadrons can with diligent application and concerted effort reduce that top command's safety rate from an unheard of 5.0 per year to a realistic .29—but why the lack of that all important allowance for clerical help. If we can see fit to expend approximately $3000 to educate a good safety officer at the University of Southern California—could we not likewise see fit to follow the example of our excellent Legal School at Newport, Rhode Island and also indoctrinate a good Petty Officer in the Aviation Safety Program. Objective—a truly qualified assistant —(if an allowance existed)—to the Safety Department to help with those never ending problems—typing, filing, etc.

AVIATION SAFETY OFFICER

● The idea of petty officer safety specialists is great, but we haven't yet gotten one officer per squadron, station, and ship—the idea of which is apparently approved at all levels of the Navy.

Accident Rate Lowered 11%

THE All-Navy Aircraft Accident Rate for fiscal '61 has been reduced to 1.7—an 11% improvement over fiscal '60, the best previous year on record.

Carrier based high performance aircraft operations increased 20% while their accident rate was lowered 10%. Fleet units of the Navy and Marine Corps are to be congratulated for this impressive accomplishment as well as the reduced overall rate.

FMFLANT, which showed the largest general improvement of any major command, lowered their rate from 2.7 to 1.9. CNATRA achieved the lowest rate of any command, .98 with CNARESTRA running a close second with 1.3.

The total cost of aircraft accidents increased this year to 297 million dollars, and the average cost per accident rose to $495,000—$88,000 more per accident than last year. One hundred forty-six fatal accidents occurred and caused the death of 280 officers and men. Rate-wise this is an 8% improvement over fiscal '60 fatal accident rate, and no change in fatalities. This continued loss of men and aircraft has a serious detrimental effect on readiness and must be countered with every means at our disposal.

Personnel error still represents the largest single area for correction although pilot error has been reduced 6% and other personnel error has been lowered 5%. Nevertheless, very little improvement has been noted in the area of carelessness or inattention on the part of pilots and ground personnel. In many cases accidents have been due to inadequate supervision—often these accidents could have been prevented by the promulgation and enforcement of standard operating procedures.

Material failure or malfunction continues to be a major contributing factor, amounting to 38%. Approximately one out of eight accidents or 12%, was attributed to material failure or malfunction of the engine, while landing gear problems accounted for 10% of the total accidents.

Despite our overall reduction in the accident rate, it is obvious that Naval Aviation cannot afford the high cost in lives and material. We can, and we must reduce our losses from accidents in fiscal year 1962.

Naval aviation can, and will reduce the accident rate if *everyone*—design, maintenance and operation personnel will give aircraft accident prevention the wholehearted, meticulous attention that it requires.

For a list of the 1961 Chief of Naval Operations Aviation Safety Award Winners, see inside back cover.

"Readiness and Aviation Safety are Primary Responsibilities of Command."—OpNav Inst 3750.14.

SAFETY AND COMMAND RESPONSIBILITY

I AM sure that none of us in positions of command has the slightest doubt as to the official assignment of responsibility for the safety records of our organizations. The real problem is the means to be employed to achieve the end. Most of us are probably like the young sheik whose father, the Sultan, gave him a harem for his birthday; we know what's expected of us . . . but we're not quite sure where to start. Today, then, I should like to cite a few of the starting places I've found useful in the hope that you may find my observations of value in the optimization of your own safety records.

Most of us do the big, obvious things. This is quite apparent when we look through the report of any AdMat Inspection and find that we've met most of the basic requirements. Most of us are prone, in the discharge of our command functions, to cover a subject once (or issue an order) and assume that our status as commanders automatically ensures that the job will be done. Most of us dislike repetition. Most of us like to feel that our positions in the 'driver's seat'—achieved with no little struggle—have at long last freed us from the mundane details of daily routine and finally have afforded the time and perspective we need

by CDR FRANK AULT, USN

in addressing the Southern Area Safety Council

to concentrate on the 'big picture.'

But if you appoint a safety officer, write a squadron SOP, pass out orders to your department Heads, require each pilot to read and initial all directives applicable to his airplane and then sit back and await results they probably won't be long in coming—in the form of a crash. Bad luck? Perhaps. It is much more likely, however, that you failed to recognize that if there is one single, significant key to success in the supervision of your safety program it is meticulous attention to detail, backed by constant repetition of any point which, from your observations, appears to have been either forgotten or ignored. To illustrate: All of you are conversant with current requirements for personal gear to be worn or carried while operating your aircraft. At one time or another every pilot has read your SOP on this subject and has read and initialled the directives of higher authority in this area. But when did you last require all pilots to fall in for inspection dressed and equipped as if for flight and then follow with an inspection of the remainder of the gear in their lockers to ensure it was usable, effective, and up to date?

Unfortunately, many people tend to treat safety either as a separate subject or as a prime objective of the operation rather than a by-product. Even ComNavAirLant's 'ghost writers' have fallen prey to this view in their primary instruction on Aviation Safety (3750.26E) wherein the commanding officer is directed to "establish and vigorously pursue an aircraft accident prevention program. The primary objective of this program shall be the reduction of aircraft accidents through the education of aviation personnel . . . ". Note that the word *'reduction'* is used vice the word *'minimization.'* Note also that the inference is clear that the 'aircraft accident prevention program' can be considered to be a separate entity, or an end in itself, instead of the inescapable by-product of operations conducted at peak proficiency. This is the negative approach to the problem.

It is my contention that safe operations evolve automatically from establishing how a thing can best be done, insisting that it be done that way, and *checking to see that it is.* Standardization implies that only the best techniques (operational, maintenance, or other) have been selected. Follow-up ensures that they are being used. Without standardization you don't even have a bench mark with which to measure performance. But don't stagnate—a better mousetrap may be invented. Be alert to possible improvements and don't be too pig-headed to accept better ideas than your own. *Draw on talent at any level. Don't be too proud to ask the man who has the dope.*

Here command with its broader perspective can do another job by examining activity in all related areas and instigating changes where performance can be amended or improved. Too often we become so immersed in inter-squadron, inter-air group, or inter-ship competition (friendly and otherwise)—or we become so enamored of the idea of 'making our mark' on our own—that we are blinded to methodology or niceties of technique displayed right next door which we could well use to shapen up our own operation. Moreover, we often 'compound the felony' by developing a good idea on our own and then keeping it a secret for reasons ranging from pure failure to pass the word to an occasional fear that the other outfits will catch up. It is in cases such as these that a commander, such as a CAG, can do a job by maintaining his objectivity and ensuring that good ideas are sorted out and given the widest possible application. A possible example of this at present might be in the Replacement Air Group (CGV-4) where at least one squadron insists that familarization students can best be taught landing techniques by stationing an LSO on the runway for talk downs during familiarization landings while one or more other RAG squadrons currently uses an instructor to fly a close wing on the student all the way around the landing pattern, through touchdown. It is clearly the job of the Group Commander to determine which, if either, of these techniques is superior, and to settle only for the best throughout his air group.

It goes without saying that you can't command unless you know your aircraft and its capabilities, and are a fair hand at demonstrating that you do. Equally important, however, is the *ability to transmit what you know.* One of the worst safety records I've ever witnessed came in a jet squadron a few years ago where the squadron commander was an ex Blue Angel with his Exec. a TPT graduate. It was a rare day when either of these gents did less than riddle the banner in gunnery—or did anything else airborne in other than the outstanding category. Yet the fatality rate in this squadron exceeded the total of all other outfits in the area. I cannot help but think that what these people knew about flying simply was not being received at the 'indian' level. This type of leadership of the 'out in front' variety with never a look in the rear vision mirror to see how the pack is doing bids fair to dull a little of the personal lustre of any of today's COs who can't get the word across.

Personnel error is still the primary cause of accidents. Fortunately, it is the area most susceptible to direct command action. Here the commander's primary tools are education and training, backed by the considered, judicious applica-

tion of discipline. To realize their effectiveness, however, these tools impose certain prerequisites:

a. You must know your people—personally and professionally. This is achieved only by personal observation under as many different conditions as possible.

b. You must retain your objectivity. Don't rely on reputation. Even an ex-Blue Angel or a Navy Cross winner must be evaluated in terms of his performance by today's standards. The basic criterion is "here and now in this job, in this aircraft."

c. You cannot tolerate mediocrity. Trouble here often stems from a misconception of loyalty. Quite often a squadron commander will defend inferior performance by one of his pilots simply on the grounds that "he's one of my boys." Today's emphasis on professionalism requires sustained peak performance. We need not (and cannot) tolerate anything else.

d. You must preach self-reliance, not blind dependence on others. Expect the other man to do his job but don't come apart at the seams if he doesn't. As a carrier air group commander I witnessed several examples on a shakedown cruise just completed where the operation got slightly out of hand at times because of a volatile combination of experienced (possibly occasionally over-confident) pilots and a 'green' ship's company. Pilots just recently off an experienced carrier had considerable difficulty in adjusting to the slower pace of a flight deck where 40 percent of the personnel were in the initial stages of learning. We were fair game for flight deck accidents of just about any description until we realized that some of the slack could be taken up by re-emphasis of the pilot's responsibility for his aircraft and the abandonment of habit patterns which had placed undue emphasis on performance by the other fellow. Once this was done, we were ready to develop the teamwork which was in satisfying evidence by the time the shakedown cruise had ended.

Another common pilot failing noted during our recent shipboard operations—often noted elsewhere over the years—was the reluctance or inability of pilots to take charge in cases of airborne emergencies. Too often a call would come from the aircraft involved stating such things as: "I have a sump light," "I have a rough running engine," or "My oil pressure is falling" with *no statement of intentions or desires.* Pilots must be drilled and drilled again until they understand that decision rests with the man in the cockpit who, better than anyone else within UHF range, knows the exact nature of his troubles and what he is capable of doing about them. The time inevitably comes when the voice of command is not available on UHF and the pilot must think for himself—whether or not he smokes that well known brand.

Earlier, I took brief notice of the word 'discipline' as it affects your supervisory function, inferring that the judicious use of discipline, in a punitive sense, was a tool at your disposal. In another accepted connotation of the word, however, 'discipline' can mean training—training that develops orderliness and efficiency. Certainly there can be no argument that emphasis on the latter connotation should result in de-emphasis of the other. In the area of discipline I think I can best help you by citing a few of the danger signs. If any of the following are in evidence in your organization you have discipline problems:

a. Sloppy pre-flighting.
b. Sketchy flight planning or incomplete or inadequate briefing.
c. Failure to wear (or carry) prescribed items of personal equipment.
d. Incomplete yellow sheets.
e. Poor radio discipline.
f. Failure to read 'all pilots read' materials.
g. Delayed or haphazard pilot's plane inspections.

There are, of course, several other items which could be listed. Examine your own units for trouble spots and get after them.

Many people have searched for years for some single, sweeping change or some major program calculated to reduce the safety problem to manageable proportions. Even the most expansive ideas have achieved only moderate success, however, and none of these can be entirely successful until we fully realize that success lies primarily in meticulous attention to even the smallest detail. Safety is so closely interwoven into every facet of aircraft maintenance and operations that it's impossible to tell where one stops and the other starts. Here are a few examples of seemingly small items which I am sure will have a material effect on the efficiency of your operations, yet unquestionably will affect your safety record, as well:

a. *Yellow sheet follow-up*—Do your pilots follow-up on yellow sheets to find what action was taken on their gripes? If they don't, does your maintenance officer hunt them down and tell them? Here is an opportunity for a 'to the point' pilot training program with dividends all around.

b. *FOD program*—Does your unit conduct a walk-down of all hanger and line areas for possible FOD prior to the commencement of flight operations each day?

c. *Briefing*—Do you use a standard briefing check-off list? Is it readily available in the Ready Room? Does the SDO keep it current with weather, PIM, and other info? Do you have standard knee pad cards tailored to your briefing format

so that items recorded are orderly and complete? Do you fly it the way you brief it?

d. *Safety Lectures*—Are they divided into basic categories by activity phase? (e.g. taxiing, take-off, in-flight, landing) Are they further subdivided into training phase (e.g. gunnery, bombing, etc.) so that proper points are emphasized in timely fashion?

e. Do you require your pilots to compute line speeds, deck runs, catapult gross weights, and other launch data or do they depend on other personnel to have the dope and keep them out of trouble?

f. Do you have a periodic, written safety quiz and/or an 'emergency of the day'?

g. Do you get off your dead duff once or twice a day to walk through your spaces, watch your organization at work, and meet your people?

h. Do you customarily assign briefing topics to each of your officers for presentation during 'All Pilots Meetings' or do your APM's feature monologues by the CO, XO, and Safety Officer?

Before winding this up I feel I should mention one source of personal pique: the so called 'meat axe approach' to safety where the threat of disciplinary action becomes a modern Sword of Damocles held by a fragile thread of whim to be exercised when an accident occurs. I feel that too often during the past couple of years the axe has been displayed as a prime method of getting the job done. Naturally, this action at any level carries through to the lowest levels below. You and I were selected for our jobs, and our subordinates were selected for theirs, only after being subjected to an intensive, exacting screening process. Let us at least have enough confidence in the screening process up and down the line to permit a man the latitude he needs to solve his problems. The time to use such tools as the disposition board is *before* an accident occurs, not after it. Let's devote our time and energies to perfecting our own operation in the hope that by so doing we may develop the wisdom needed to recognize trouble in its incipient stages.

One final word: how do you know whether you're doing the job you should? If your only measure of performance is your safety record your mark can only be negative since accidents that don't happen don't hit the record. On the other hand, your failures are plain to see.

The only true evaluation of performance comes from your state of operational readiness—however measured. Almost invariably the highest states of readiness are characterized by low accident rates in those organizations where safety is viewed—not as an end—but an inescapable by-product of a sound doctrine; *formulated* from the best sources of knowledge and experience, *flown* as specified, and followed-up continuously, at every level, to the minutest detail.

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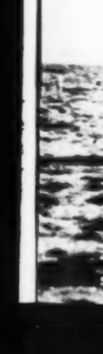


NAVAL 50th ANNIVERSARY 1911 1961 AVIATION

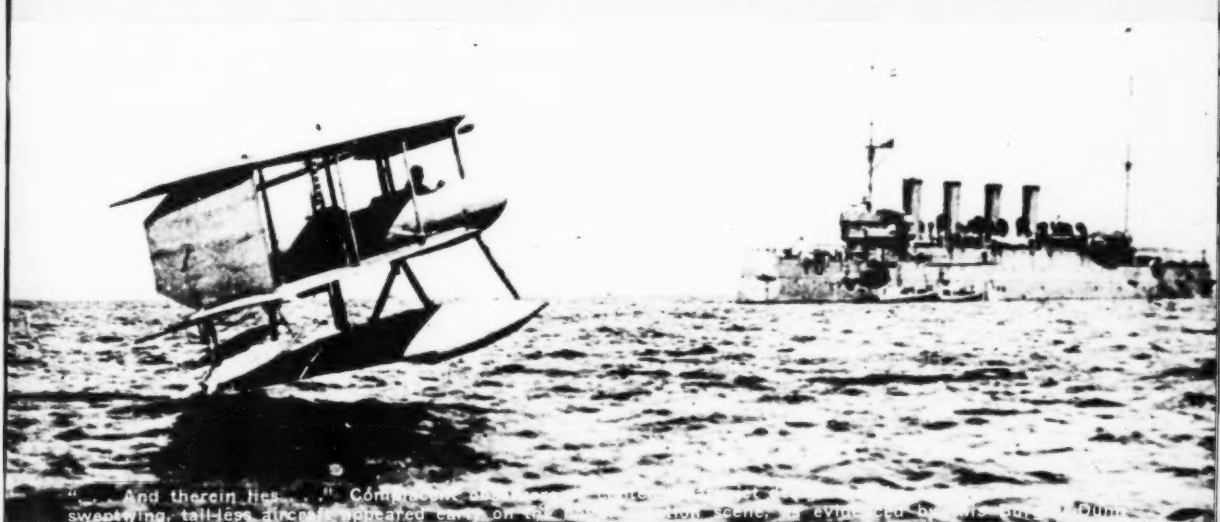
Origin of the Species

by CDR R.P. Brewer

Somewhere, in the chronicling of aviation's progress, say between Jules Verne and Yuri Gagarin, the attention of both the reporters and the readers became centered on the principal subjects: People and Planes. The people were represented by pilots, grim and glamorous, and the planes by a sometimes unsteady succession of airborne marvels ranging from the Wright "B" to the X-15.

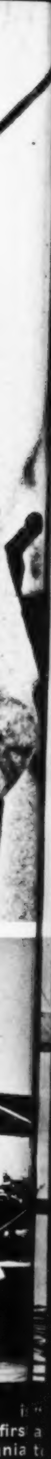
Each era contributed its characters and creations to the aviation picture, with clattering contraptions manned by silk-scarved young heroes giving way to sleeker, noisier machines piloted by even younger heroes. *Jenny* and gauntlet were replaced by jet and g-suit, in a manner variously recorded by *War Birds*, Antoine de Saint Exupery and Arthur Godfrey. Each era was an extension of the previous one—and *all* eras had one thing in common: the unchanging fact that the basic problems remain essentially the same. The number of answers naturally increases as experience accumulates, and so too, increases the debt of each new generation of pilots to the Elder Pilot.

This is simply an evolutionary process, and only a short stroll down memory's taxi-strip can pro-



"... And therein lies ..." Compla[illegible] sweptwing, tail-less aircraft appeared ea[illegible] on the [illegible] scene, as evidenced by this [illegible] seaplane, vintage 1916, at [illegible], Florida.

NAVAL AVIATION FASHION NOTE 1911 is modeled by Eugene Ely after completing the first aircraft landing aboard ship, the USS Pennsylvania in San Francisco bay. Close inspection will reveal the ingenious forerunners of several important survival items: the wrapped around inner-tube is probably the first version of the later "mae west" vest and the pilot's converted football helmet and flotation tanks beneath the wings are direct ancestors of today's survival equipment.



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FIRST OF MANY Naval Aviators was Lt. T. G. Ellyson, USN, shown here in an early flight with pioneer pilot and airplane builder Glenn Curtis. Control mechanism was simple, instruments non-existent, and dress casual, but the spirit and determination of these early airmen is completely evident.

vide impressive proof of the ancestral linkage between present flight operations and past development. The relationship is astonishingly clear in the field of anti-prang-and-bang endeavor. Just a glance at the records will provide a better picture of this Earlybird, whose sometimes painful progress showed that he (a) was able to recognize problems yet to be encountered, and (b) attempted to provide answers for these problems in a surprisingly knowing manner. Skeptical?

Well, for example, did you ever consider, as you homed in unerringly, like a martin to his gourd, via your trusty Tacan, just who might have made the *first* aerial navigation flight? And with what, chuckle, navaids? Or possibly, as you essayed a hookup for a gulp from a tanker plane, might you have pondered briefly as to when the *first* in-flight refueling was accomplished? And maybe it might have occurred to you to wonder, as you squirmed into your integrated harness, just where and when did people start wearing chutes and mae wests and hardhats and such, hmmm?

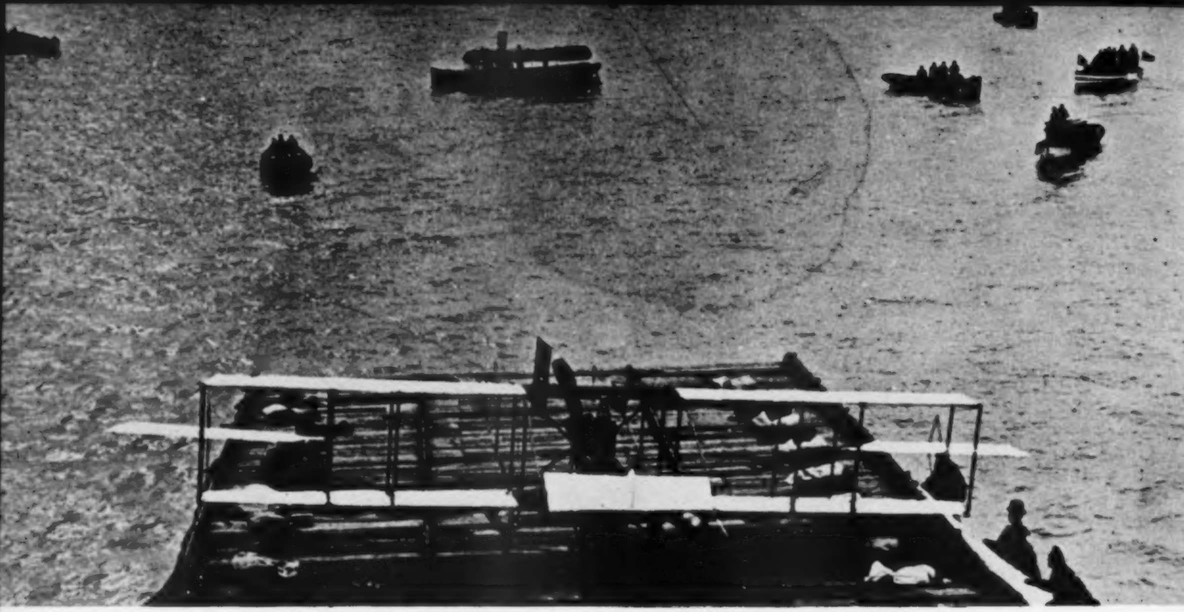
Certainly we don't visualize these complicated gadgets and gimmicks, designed to keep us happy and efficient at our aerial chores, to have been neatly created overnight in answer to specific needs. The evolution was based primarily on a natural urge of the Elder Pilot to keep himself unified (in one piece) in an often unfriendly environment. Let's look at some of the results of his efforts.

As has been written, the first Navy man to fly, HTA that is, was Lt. George C. Sweet, who in 1909 went as a passenger in the first Army Wright aircraft (this was five years BFP—Before Flight Pay). For the record we note that as far back as 1861 an observation balloon was operated from a Navy gunboat—color of observers' shoes undetermined. The first Naval Aviator, of course, was Lt. Theodore G. Ellyson, who learned to fly with Glenn Curtiss in 1911. (His first flight is particularly interesting inasmuch as his machine was a ground-bound "grasscutter" not intended to become airborne!) The first Navy aircraft was the well-known Curtiss *Triad*. The first Navy Wright aircraft was delivered, at Annapolis, by Orville. (Wonder who pulled the acceptance checks?) In the same year, 1911, the first Navy aircraft specifications—"milspecs"—were published. This was also the same year that BuMed published the first Navy flight physical exam.

Following Eugene Ely's first takeoff from a Navy ship in 1910, and the subsequent landing aboard a ship a few weeks later, just about every flight might be considered a first of some kind. First night X-C was made by Lt. Ellyson (the same) in July of 1911. The first naval aviator to make a night water landing was NA No. 3, Lt. John H. Towers, who made a series of landings on the Severn River in 1911, using for "seadrome"

"Keep the motor running, George, I may be back after the third inning" might explain what appears to be an early aerial excursion by a baseball umpire, but in reality this old photograph shows the "Father of Naval Aviation," Capt. W. I. Chambers taking a

WWII types may recognize this early photo of Marc Mitscher. Equipment-minded folk will also spot (1) the leather safety lap belt with the quick-disconnect thumb latch; (2) canvas mae west; (3) padded headrest; (4) "binnacle" float compass.



Eugene Ely landing aboard PENNSYLVANIA in Curtiss pusher—1911.

markers baskets of flaming gasoline in small boats. Incidentally, this same pilot, who made a career of achievement, set a world's endurance record in 1912, staying aloft six hours and ten minutes to become an unquestioned plank owner of the butt-buster club. Seems the first major modification was incorporated in November, 1911, when the Wright B-1 was modified from a land plane to a hydroaeroplane.

The first Navy catapult was a compressed air affair mounted on the seawall at Annapolis, from which Lt. Ellyson (the same) made the first cat shot in 1912. (Wasn't completely successful as the airplane tripped on a guide wire and dove into the water.) A later shot from a modified cat was successful. Present-day cat officers, weary of constant accusations of stingy cat pressures may derive some comfort from the fact that the end speed of this first shot was 35 mph, and there's no record of complaint from the pilot.

Pictures of Ely's historical landing aboard the PENNSYLVANIA reveal several possible firsts and a

Survival problem—and answer. The life raft shown here looks remarkably similar to ones in present day use, although the date of this trial launching is 1925. Possibly familiar, also, is the pilot aboard this "air raft" developed for use by Navy fliers with the MacMillan Arctic Expedition; none other than Richard E. Byrd, then a Lieutenant Commander, USN.

considerable amount of ingenuity. The airplane had tricycle gear; it also sported two pontoons for flotation (just in case he got L & S in the groove). You'll also notice Gene thoughtfully wore a vintage version of a crash helmet (prompted no doubt by the location of a fuel tank directly over his noggin). And, as Madison Avenue chroniclers might have phrased it, when he dressed to fly, Ely chose to rely on the first pneumatic mae west—a sort of Bikini or flat-look model consisting of a wrap-around bicycle inner tube.

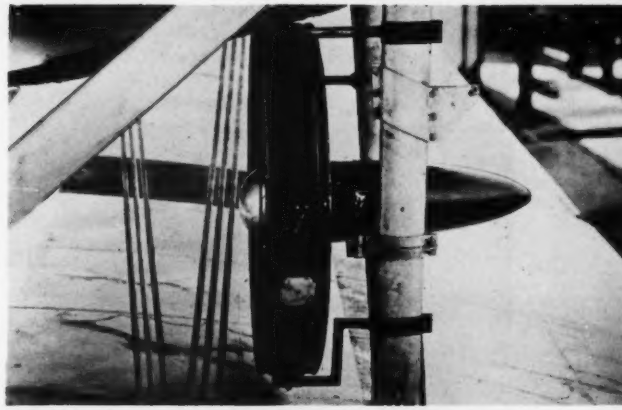
A tragic first occurred in 1913, when Ensign W. D. Billingsley became the first naval aviator to be killed in an airplane. He was thrown from a spinning Wright O-2 seaplane and drowned. Billingsly had no safety belt. A fellow pilot Lt. Towers (the same) held on to a strut, and although injured was able to resume flying a few months later. The first safety belt did not appear until 1916. A year after that, Captain Francis Evans, USMC, looped and spun a seaplane for the first time I/S (intentionally and successfully).

For the folks who might figure this inflight refueling to be pretty new stuff, be advised that the possibilities of air-refueling were demonstrated by Lt. Godfrey Cabot, USNR, in 1918, when he lifted 155 pounds of weights from a moving sea sled into his Burgess-Dunn seaplane. Two years later he parlayed this feat into picking up a five-gallon can of gas from a float in the Potomac near Washington. (The first plane-to-plane pipeline refueling was accomplished in 1923.)

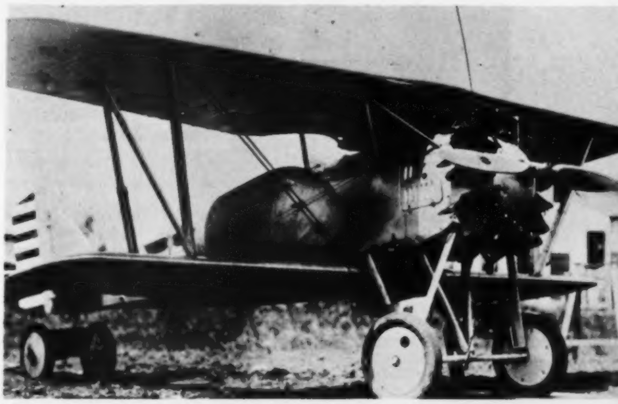
As time went on, the truth of the pre-sputnik axiom that "everything that goes up must come down" became grimly evident, and in 1919 a Navy General Order directed that parachutes be carried on all blimp flights. Shortly afterward the Order was amended to include kite balloons, with the added requirement that life preservers be carried on all LTA flights over water No recorded comment from the HTA hangars concerning oversights, and it was not until three years later that parachutes were first issued for the heavier-than-somewhat people. The first shipment of parachutes went to Marine aviation units.

The first emergency use of a parachute did not come until 1924, when gunner W. M. Coles, USN, of VF-1 made a successful leap from his JN following a, you guessed it, mid-air collision. Already the air was getting crowded, with closing speeds of Mach 0.2! During the same year the first parachute school was opened at Lakehurst.

First navaid in the "birddog" category seems to have been used in July of 1920 when an F5L seaplane, using a radio compass for navigation, was flown from Hampton Roads to the OHIO at sea. It isn't known if the pilot made his "Charlie" time. Earlier experience in compass course DR nav probably indicated a nasty interpretation of "Dead



Drop-out power pod ancestor is seen in this radio generator installation of the 1930s.



Ditch Pitch Circa 1929—Aircraft flotation bag gear; one version incorporated an "impact activator" to inflate bags automatically on water landing.

". . . And you said you knew the route like the back of your hand!"

"Take me to your OTC" might be an appropriate greeting indicated here, but the leather-garbed masked figure is famed Navy pilot Lt. Apollo Soucek receiving a good luck handshake as he prepares to take off on one of his altitude record flights of the "Thirties."

Reckoning" and a need for additional information in the cockpit.

In 1922 the first "radar" observations were made at the Naval Aircraft Radio Laboratory at Anacostia—sort of a APS 0.1 gear you might say. A year later there appeared the first mechanically inflatable life raft, early versions of which resemble present day models quite closely.

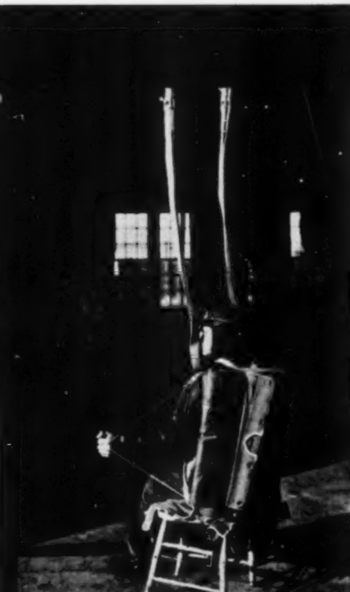
In 1926 a variation on the parachute theme was tried out over NAS San Diego, when an *aircraft* parachute was deployed to waft a *Jenny* training plane down from 2500 feet. The airplane was damaged, but the pilot was able to walk away from the landing—rapidly, we suspect—as nothing much more was heard of *that* idea.

Liquid oxygen was first used in airplanes in 1928, and those conversant with the rigid handling requirements of aviation LOX may understand the lapse between initial experimentation and general deployment.

By 1930, aircraft builders had corralled enough horsepower and sufficient structural strength to pose a definite "G" problem for the pilot, and the first anti-blackout suit was produced. Whereupon the scales were again balanced in favor of the pilot and determined Dilberts could resume pulling the wings off.

In 1931, came electrically heated flight clothing (general issue of flight clothing had begun in 1916), which proved a boon to both the fur-burdened aviator and to future electric blanket manufacturers. (No, commander, we don't know who had command of the heat control in multiplane in-

Parachute development took on many aspects, *viz* this quintet of models ranging from the (1) 1926 laundry bag, (2) 1927 version of rubber boat attachment; (3) a surprisingly trim Smith-Floyd backpack (note cross draw O-ring); (4) an experimental harness of 1931; and (5) an Irving seat pack of 1929.



stallations.)

World War II brought a host of innovations and modifications to equipment—notable items being shoulder straps (equally impressive was the number of canopy panes busted by dangling straps which pilots initially scorned to use), and the introduction of non-inflammable hydraulic fluid. Another significant milestone was logged in 1942 when Lt. Bruce Griffin made the first radar GCA landing at Quonset Point.

Throughout this early period of naval aviation, coordinated, Navy-wide efforts in the field of aviation safety appear to have been sketchy at best, and the grim accident rates of those years reflect the hazards of the flying art. True, the art, now variously labeled as airmanship and professionalism, required a certain combination of guts, gall and gumption, tempered with a shrewd awareness of J-factors. But despite a scarcity of calculated, command guidance in aviation safety, it may be concluded that the Elder Pilot respected his airplane, for what it could do *for* him and also *to* him should he choose to play fast and loose with the critter. For then, as now, the reckless pilot could earn himself the indelicate label of "meathead" without necessarily "bagging one" or " buying the farm" as the saying goes in the trade.

Not until the immense expansion of aviation activity attendant to WW II did there appear any major evidence of command concern over the problem of aviation safety—lack of. In August of 1943, the Chief of Naval Air Intermediate Training directed that Aviation Safety Boards be established at each training center under his command. The immediate success of this effort undoubtedly influenced CNO a few months later to extend this directive to include Aviation Safety Boards in Primary and Operational Commands. Then, early in 1944, "Flight Safety Bulletin No. 1," perhaps the earliest known ancestor to APPROACH, was issued jointly by DCNO (Air) and the Chief, BuAer, announcing their intention to issue consecutively numbered bulletins concerning the safe operation of naval aircraft.

In June 1944, DCNO (Air) reported that the Aviation Safety Boards established in one large command had, in one quarter of operation, substantially reduced the fatal accident rate—then an awesome 47 percent of all accidents. At this time there was directed the establishment of similar boards in other commands outside of advance combat areas, and the appointment of a *flight safety officer in each squadron.* One month later, to achieve economy of effort and unity of purpose by coordinating all safety functions through a central organization, a Flight Safety Section was established in the office of DCNO (Air), and this office was assigned the direction and supervision of the aviation safety program.

Phase II, recognition of the need for organized assault on the problems of aviation safety, had been accomplished. The next phases, Command Responsibility, and Individual Professionalism, were still to be achieved, and the Jet and the Swept Wing and Sonic Speeds and a baffling thing called Human Factors all were evolving too. . . .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THE COMPLEAT AIRSTART

(With Apologies to Izaak Walton)

THERE was a bang, and suddenly it was quiet . . . Whahoppen? . . . FLAMEOUT!

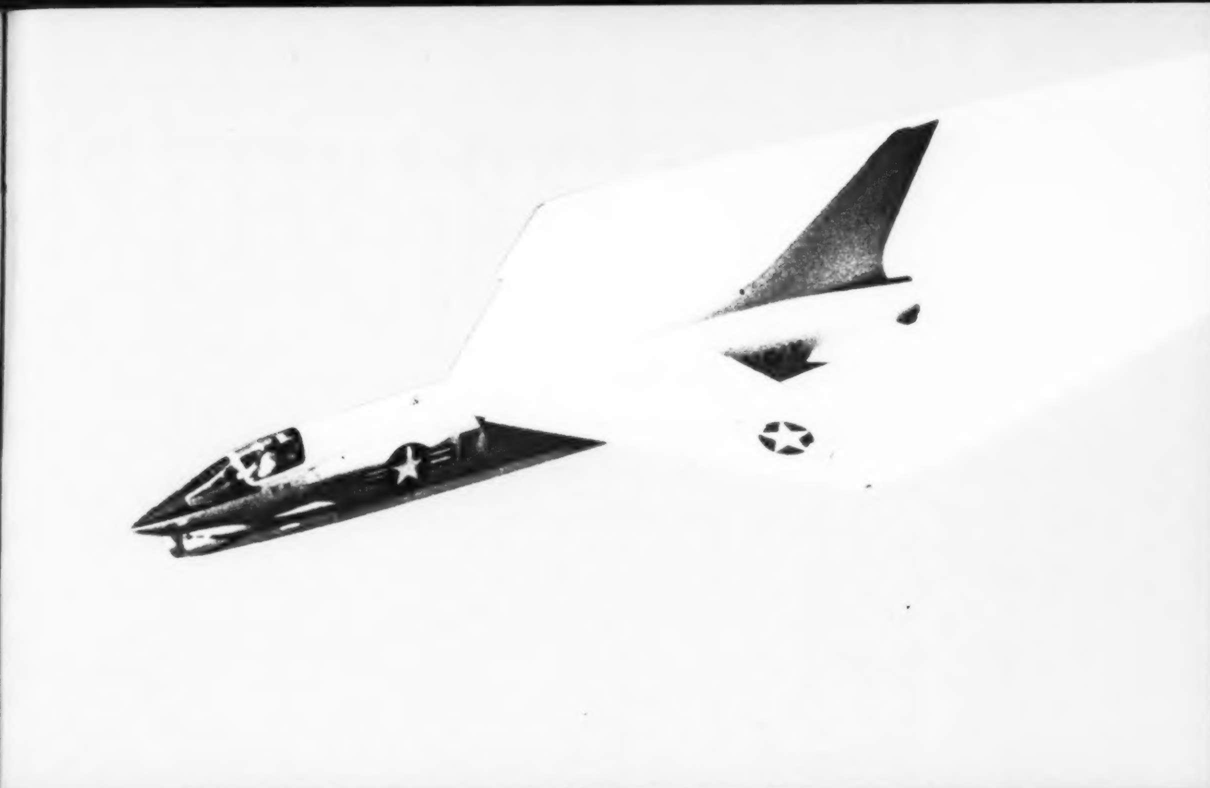
Technically, a flameout is the interruption of the flame within the combustor, either by an abrupt change in air flow (compressor stall), or disturbance of fuel flow. At high altitude, a flameout may be of little concern, depending on the cause—some flameouts occur because there are pilots who inadvertently (sometimes intentionally) retard the throttle to cutoff. But at low altitude, a flameout can mean certain disaster.

In the flight manual, the flameout-airstart procedure begins . . .

Fuel transfer switch—ON
Emergency power handle—PULLED
Emergency generator switch—ON
UHF switch—OFF

The procedure goes on to point out that on some early F8U-1's (prior to BuNo. 143822), ignition power is available only with the emergency generator switch ON. Since the purpose of this article is merely to supplement information in the Flight Manual, not replace it, we assume that you are familiar with the rest of the airstart procedure in section III.

Let's say your flameout occurred because of lack of fuel boost pressure. How can you be sure, and what can be done about it? If the engine fuel pump light is ON, it indicates that the pressure in the primary stage of the engine fuel pump is less than 100 psig. This low pressure can be caused by pump cavitation at altitude due to lack of boost pressure, or by failure of the primary stage itself. If illumination of the pump light is accompanied by a ZERO fuel flow indication *and ZERO % rpm*, the accessory drive has probably failed and no airstart is possible. But if the light comes ON *and ZERO fuel flow is indicated* with all other readings normal—rpm 17% to 20%, EGT 150°C, DC power indicator showing a "V"—the odds are that the flameout is the result of engine pump cavitation (air in the pump instead of fuel). In this case, the chances of obtaining an airstart above 15,000 feet are slim. There is a sure-fire way you can tell whether or not you have engine pump primary stage pressure—by monitoring fuel flow. If fuel flow is indicated and the flow can be varied by throttle movement, the only thing missing is ignition. After you've investigated this, bring the throttle to cutoff to allow the airflow to purge the excess fuel from the combustor and then engage the ignite switch



momentarily. With sufficient volume on the UHF, you can hear the igniter interference in your headset. If no clicks can be heard, check to see that UHF is on (don't transmit for longer than 3 minutes after a flameout while still above 27,000 feet). You should already have checked the electrical power system, but troubleshoot it again if necessary. Even try cycling the engine master switch and pushing the ignite button with your finger. Remember that each ignition cycle runs 30 to 40 seconds. You've got to have a spark to get a fire!

Now if you hear the click all right but there is zero fuel flow and all else is checked, switch the fuel control to MANUAL. If the fuel flow comes up, you know it was a fuel control problem all the time and you can proceed from there.

Getting the proper fuel flow is extremely important. If there is none, too much, or too little, a relight is impossible. If you are burning JP-5, you have to control the flow to avoid an over-rich condition leading to failure to relight.

Then, too, you ought to think about this handy technique: Because the fuel flowmeter accuracy is marginal in the very low-flow region, it is now recommended that you perform JP-5 airstarts by advancing the throttle slowly from cutoff to idle while the ignitor is running. If you don't get 750 pph indicated fuel flow at IDLE, advance the throttle slowly above IDLE until 750 pph is indicated on the flowmeter. All of this throttle manipulation must be done while the ignitor is running, which means you've got to get from cutoff to a maximum flowmeter reading of 750 pph within 30 to 40 seconds. If you do, the fuel flow will pass through the optimum mixture while the ignitor is still providing the necessary heat to obtain combustion. Joy! An airstart will be obtained. On JP-4, fuel flow control is not so critical, and an airstart can usually be obtained with the throttle at IDLE. Again note that if adequate fuel flow is not indicated in normal fuel control mode, you must switch to manual fuel control and move the throttle to obtain the correct fuel flow.

If you've tried everything without gotting a relight and you have to leave the bird, you can help the accident investigator (and other birdmen) immeasurably if you can tell him all the gage readings.

If a flameout occurs at traffic pattern altitude, *refer to instructions printed on the inside of the face curtain.*—*Chance Vought Flight Safety Bulletin* ©

TIPS FOR TANGO TRAVELERS

by CAPT. RICHARD CRITZ, USMC

VMT-1 ASO

All us -8T drivers have considered the possibility of autoacceleration at altitude and are well briefed on the recommended remedies of such. But, have you given any thought to the possibility of autodeceleration and its consequences?

Before you stop reading because you think autodeceleration is only a remote possibility, it may be well to state that VMT has encountered four instances of autodeceleration this fall and one resulted in a pilot-induced flameout. And don't be lulled into a false sense of security by thinking that if the old standby J-48-P8A engine had been installed and the fuel control heat switch properly used it wouldn't have happened. Three out of four of the above cases happened with aircraft with the -8A engines in which the fuel control heat switch was turned ON immediately after takeoff.

The cause factors of autodeceleration get rather involved, but bear with us and we'll try to shed some light on the subject and a couple of remedies thrown in also.

Cause A: A lean altitude capsule setting in the Holley fuel control.

This is easily recognized as you go straining for altitude with the steady ole Pratt-Whitney heat pump losing its normal rated RPM/TPT as you groan above 34,000-36,000 feet (the altitude where the lean capsule setting might appear.) You will notice a decrease in the RPM/TPT and bending the throttle over the catapult grip is to no avail.

Remedy for Cause A:

Reduce the throttle setting, leave the fuel system selector in PRIMARY and descend. As you decrease your altitude below that at which the RPM/TPT began to unwind, normal response to throttle movement will be regained. (You really didn't want to fly this hop at 47,583′ MSL anyway!!)

Cause B: Ice in the fuel control Servo System.

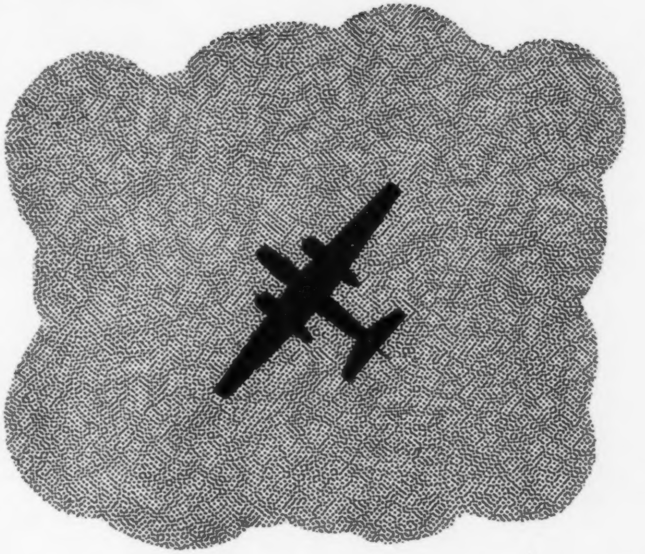
It is interesting to note that, although ice in the fuel control usually results in the autoacceleration, occasionally ice crystals will form in the servo system, causing the acceleration servo value to move in a more open position; consequently throwing the engine-driven pumps to lower stroke and output, result=deceleration. The indication to the pilot will be, that while maintaining a constant altitude and throttle setting the RPM/TPT will commence unwinding.

Remedy For Cause B:

The remedy in this situation is identical to that for autoacceleration. Reduce the throttle to IDLE (and make sure it's all the way back to IDLE) and switch to MANUAL the (emergency) side of the fuel control, and descend.

It is worthy of note that the formation of ice crystals is much more predominant in JP-5 fuel than in JP-4. The word from the Holley rep is: that below −40°C the specs on JP-5 are such that the formation of ice crystals is more likely than it is with JP-4 at and below the same temperature. When these crystals (slush) form in the fuel, the viscosity is raised to such a point that efficient operation of the primary side of the fuel control is impaired (causing autoacceleration/deceleration.) The affinity of JP-5 for water causes the more rapid formation of ice crystals (slush) at temperatures of −40°C and below than found in other fuels. During the winter months temperatures at 40,000′ in the skies around the Carolinas are often recorded below −70°C, enhancing the possibility of your JP-5 fuel becoming SLUSH!!! The danger lies not in the engine-driven pumps being able to pump the slush through the fuel manifolds, but the ice crystals forming in the fuel control servo lines and servo system. When this happens the fuel control is going to give the engine-driven pumps erroneous information as to the true fuel needs of the engine at the specific altitude and desired throttle setting.

A Final Remedy:—Whenever autoacceleration or deceleration is encountered, descend to a lower altitude, preferably a hard surfaced runway with the gear extended.



Where There's Smoke---

In our S2F squadron we have tried to develop the attitude that when the fire warning light comes ON the best thing to do is land. The *Stoof* dash one and two fire warning lights are located under the sun shield and are hidden from view when the seat is raised (this is corrected in the S2F-3). There have been incidents where the fire warning light came ON because of a faulty circuit and as a result a feeling sometimes develops that the system is unreliable.

In this incident after turning downwind following an initial launch for FCLP, both pilots smelled smoke which seemed to come from an electrical fire. When they looked back into the electronics compartment they saw smoke and then notified the tower. At this time the pilot noticed the port fire warning light. Just prior to the 180 spot for a normal mirror landing, the light went out. Since the copilot had pulled all the circuit breakers behind the pilot and the smoke had stopped the pilot assumed that his trouble had been an electrical fire and was not concerned about his fire warning light. He continued on in for a normal landing.

Upon reaching the line, the exhaust stack from the outboard port engine was found hanging out of the cowl flaps. The clamp had broken and allowed the stack to fall clear of the exhaust port. Exhaust flame had burned about 3 inches off a couple of stiffeners, warped the fire wall and blistered the paint.

Up to now we have not determined how the smoke reached the electronics compartment but the feeling is that the burned paint caused the smell of an "electrical" fire.

This incident was sufficient to rid the squadron of complacency over fire warning lights for the time being.

With Rigor

How many times have you read this? "After touchdown the wheels folded and the aircraft settled to the runway." Then come the comments of the accident board: "The board is of the opinion that the pilot inadvertently actuated the landing gear handle when he intended to raise his flaps."

On a recent flight I found out how this can occur. At the time I was participating as copilot on a test flight in the S2F. With the test hop completed we came in for the landing. It was a professional approach and touchdown but immediately after we were rolling on the concrete the pilot went into his act: Flaps Up, Cowl flaps OPEN, oil cooler doors OPEN, fuel boost pumps OFF, rudder assist OFF, anti-collision light OFF, pilot's overhead hatch OPEN. He didn't miss the radar altimeter—it was OFF to begin with.

All these items just about finish the post-landing checklist. We touched down at 80 or 85 knots and they were accomplished by this amazingly efficient pilot before the needle got below 70 knots.

After shutdown, I congratulated the pilot on his dexterity and his brilliant memory but reminded him that at touchdown he should eliminate the calisthenics. He honestly never realized he did this. We are good buddies and I will fly with him again but he promised to let me remove the axe from its storage position and hold it on my lap as a reminder to complete the landing roll out *then run the post-landing check.*

ANYRAT

VMR-253 was highly concerned over the posbility of sabotage on one of its R4Q aircraft. Navy Intelligence was called into this case and local commands met to strengthen the security of its flight lines. Fortunately an old Navy hand from a neighboring VP squadron heard of the case and came forward to solve the problem. VMR-253 has rodents on its aircraft. Case closed. Forwarded for information.

JOHN C. SCHODEN
Commanding

Subject aircraft had been in rework at SMIC, Itami, Japan. After acceptance of this aircraft normal operation was conducted until the aircraft's Tacan and ADF were reported inoperative. Repairs were made to severed wires located in the aircraft lavatory compartment. Subject wire bundle is called out as item 20, figure 323 of T.O. 1C-119F-4/ Navaer 01-115CCB-4. Wire bundle is shown in photo (1).

Four days later the above discrepancies were again reported. The same type repairs were accomplished to the same wire bundle.

Four days later preflight inspection revealed the Tacan in-

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operative. Investigation revealed the D.C. Tacan wire was again severed. Photo (2) shows the D.C. wire severed as found. Six wire splices are also visible in photo (2). These were previous repairs. The severed wire had a clean, slanting cut, and was undamaged except for this one cut section. At this time the Station Investigation Department was called for assistance.

The next day rat droppings were found in the aircraft. The Air Station Preventive Medicine Section was called and they confirmed that the aircraft was infested with one or more rats. That evening traps were set but no rats were caught.

A rat was found dead in a trap, photo (3), two days later. This trap was positioned about 24 inches from the damaged wire bundle shown in photo (2). The Preventive Medicine Section removed the rat from the aircraft. The Preventive Medicine Section was requested to identify and examine the rat for fleas and the possibility that the rat had devoured portions of the wiring.

The Preventive Medicine Department reported that the rat contained no fleas. In addition they reported that the rat's stomach contained what appeared to be plastic material, assuming that this material could be wire insulation. This sample, plus a sample of damaged wire, was turned over to Naval Intelligence for further laboratory inspection and identification.

At this time the O.N.I. and laboratory report is still pending.

This department plans to continue inspecting all squadron aircraft for the presence of rats and/or rat damage.

It is recommended that any activity experiencing unaccountable wiring damage inspect the aircraft for rodent infestation. It is interesting to note that the wiring was not gnawed or chewed but was clean cut very much like a knife cut. It was most fortunate that the rat selected navigational aid wiring and not a primary electrical circuit to devour. Had he selected a primary electrical circuit, it is possible that this incident could have resulted in an aircraft accident.

OXYGEN QUIZ

1. The primary cause of altitude hypoxia is:
   a. the percentage of oxygen decreases
   b. you hyperventilate (breathing too fast and deep)
   c. your blood circulates more slowly
   d. the partial pressure of oxygen decreases

2. The function of the body first affected by lack of oxygen is:
   a. vision
   b. circulation
   c. hearing
   d. speech

3. Hyperventilation causes:
   a. reduction of CO_2 partial pressure of the blood
   b. reduction in oxygen partial pressure of the blood
   c. reduction in nitrogen partial pressure of the blood
   d. hypoxia

4. The primary factor that controls your rate of respiration is the concentration of:
   a. nitrogen in your blood
   b. carbon monoxide in your blood
   c. oxygen in your blood
   d. carbon dioxide in your blood

5. Before high altitude flights, you should:
   a. avoid eating
   b. eat a normal amount of food that agrees with you
   c. eat food high in starch
   d. eat food high in fats and proteins

6. A "CIRVIS" report is:
   a. a weather report
   b. a severe weather or thunderstorm report
   c. a casualty report
   d. a sighting of enemy or unfriendly aircraft, ship or submarine

7. It is not necessary to include fix or geographical location in the initial call-up when contacting FAA Air Route Traffic Control Centers.
   a. true
   b. false

8. If you are filing an IFR flight plan for an altitude above flight level 290 within a controlled airspace on an airway running generally in a northwesterly direction you would file for which flight level?
   a. 300
   b. 350
   c. 360
   d. 370

9. When cleared by ARTC on an IFR flight plan which crosses a military climb corridor it is necessary to contact the climb corridor controlling agency for authorization to cross.
   a. true
   b. false

10. Where no RNG or ADF facility exists, the surveillance approach minimum will be no less than —— feet ceiling and —— mile visibility, day or night.
   a. 200 and 1
   b. 400 and 2
   c. 300 and 1
   d. 500 and 3

See WHIZ QUIZ answers on page 48

The Narrow Path of Good Judgment

by LTJG Ralph Richter, Jr.

There was a time when *aviator* and *daredevil* were synonyms. A man who flew was, in the public mind, something of an oddity, a reckless gambler. Some of this old swashbuckling attitude still remains, but only as a gentle tradition, and only on the ground. The aviator of today is a professional man.

What caused the change of the aviator in the public mind from

The Narrow Path of Good Judgment was written by LTJG Ralph Richter, USN, while he was attached to Attack Squadron 75, based aboard the USS INDEPENDENCE (CVA-62).

LTJG Richter is a graduate of the NROTC program at the University of Oklahoma. He holds a bachelor degree in Geology.

Following college graduation, he entered the flight training program, earning his wings on Christmas Eve, 1958. After Replacement Pilot training, he reported to VA-75 in May 1959.

LTJG Richter is a native of Bartlesville, Oklahoma.

the daredevil to the professional? The answer lies in the path of good judgment. The aviator has, by keeping on this path, proven to the world that he is able to stand side by side with other professionals as one of them. He knows that the path is a narrow groove which has no edges to prevent one from wandering out. He understands that the outline is not clearly defined, but is shadowy, hazy, and difficult to distinguish. Although the path is straight, he is fully conscious that it is more often than not, clearer through hindsight than foresight.

Specialized training and experience help to give the skill to do the job after a decision has been made. Also through training and experience, the aviator is able to gauge his skill and know his own limitations. But the old stunt fliers had skill too; so there is something else needed to remain within the path of good judgment besides skill alone.

Responsibility: Certainly a doctor has responsibility; so does the aviator. He always has the responsibility of his own life, of course. The pilot of an aircraft with passengers has several lives in his care, and the single-engine pilot is expected to conduct his flight in such a manner as not to endanger the safety of others. Aside from the human responsibility, there is also the very considerable expense of today's aircraft to think about. The improper decision of an aviator as young as 20-21 years could cost the United States more than a million dollars. Responsibility, then, is a sobering element that tends to keep an aviator within the path of good judgment.

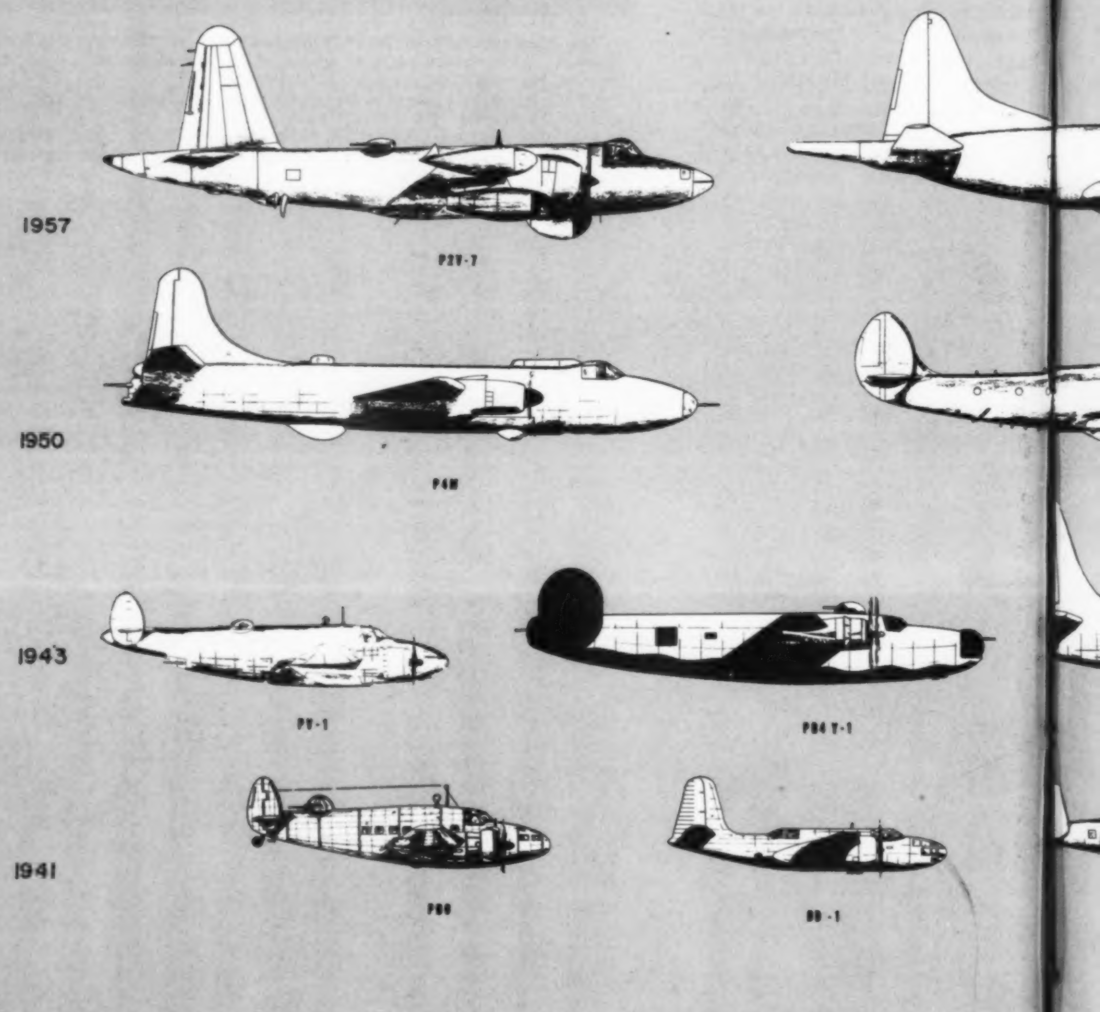
This element is not one that is suddenly thrown upon the shoulders of a young aviator. When a student has earned his medical degree, it is not because he has on some certain day become an expert in the field of medicine. It is simply that, in effect, learned men have said to him: "We trust your good judgment now. As you continue to learn, you now have the responsibility of making your own decisions." Similarly, a new aviator is not an old pro because he may wear wings as of the date of his designation. He has merely reached a point where his decision can be trusted.

A professional cannot expect to remain on the path of good judgment for long by avoiding decisions. They must be made. An error of deliberate omission is not only cowardly, it can easily be as fatal as one of commission. Because an error in judgment which may have been embarrassing in 1927 or even 1947 can be fatal in 1961, an aviator must also have courage. Flying under a bridge is not courage. It is foolishness. Neither is it courageous to attempt a forced landing with a damaged aircraft when the odds are stacked heavily against success. To succeed would be no more than luck. Courage is faith in one's own abilities and convictions, and the confidence to act positively upon them—positively and quickly.

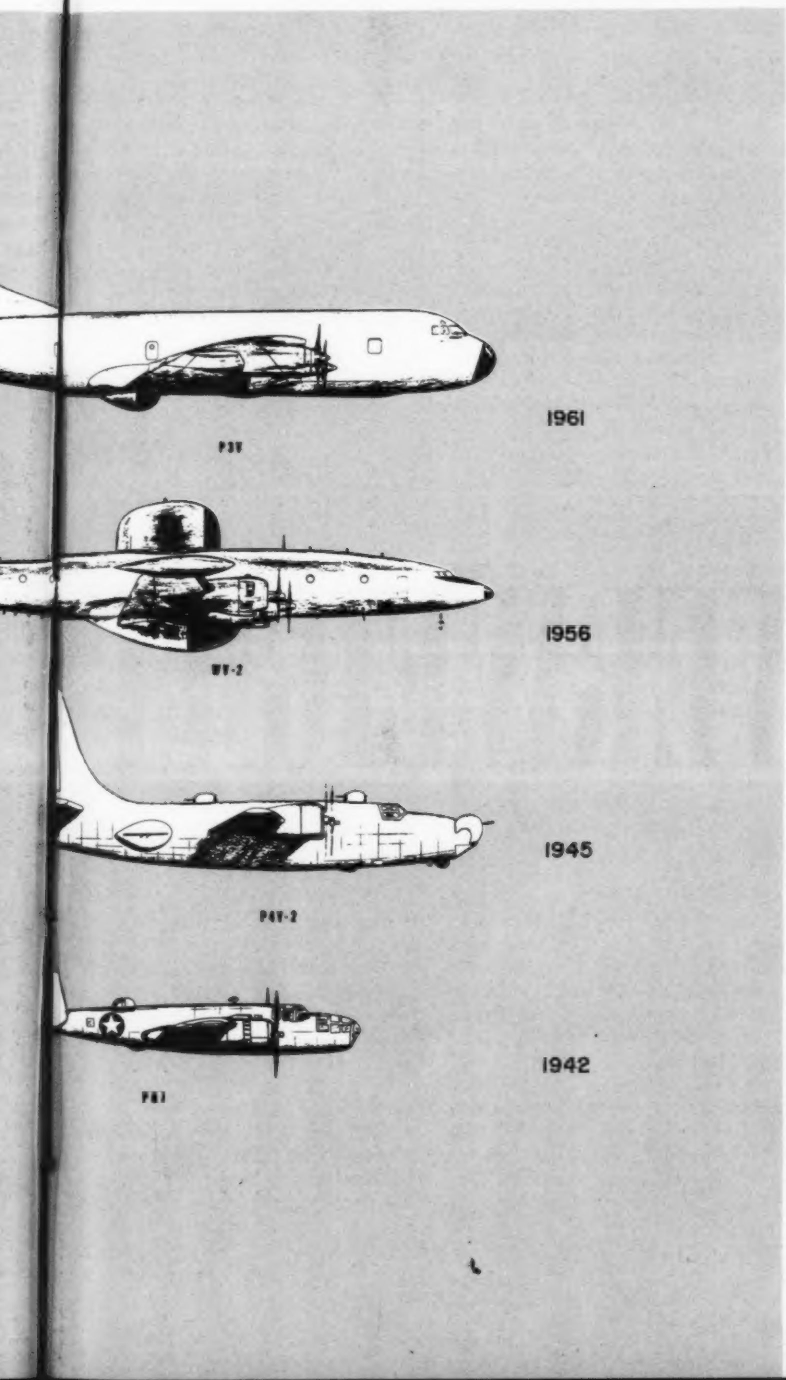
A professional can never relax from his conscience when making decisions. His conscience is his personal guide. Through conscience, his training and all the elements that tend to keep him on the path of good judgment are held at their peak of efficiency. The stimulus to go again when the right decision—as it seemed—failed, is backed by the man's own conscience. He must be able to say to himself that under the same conditions and having the same information available, the decision would still be the same.

Because the aircraft of the future will not be any slower or any less mechanically complicated, the professional aviator cannot afford to have a conscience that is satisfied with decisions which only require him to remain in the shadowy or hazy portion of the path. He must be clearly within its narrow boundaries. As a professional, he must continue to study and train. And he must realize that for him, the path of good judgment is not only narrow, it is continuously *narrowing*. ©

DEVELOPMENT OF LANDBASD



ASD PATROL PLANES



ORIENTED in thought and action toward control of the sea, the Navy indirectly acquired a tradition of seaplanes for patrol work. An exception was the 1920 purchase of large, multi-engine Martin Bomber for torpedo dropping experiments.

In late 1941, with land-based bombers outclassing seaplanes in nearly every department except water landings, and with hints of a new type of warfare on the horizon, the "Seaplane only" tradition was broken. First Navy land-based patrol planes were Air Corps bombers with few modifications. Navy specifications were introduced in later versions. Shortly after WW II the P2V-3 became operational and was, generally speaking, the first land-based patrol plane designed "from the keel up" for Navy duty.

Jet power was added to patrol planes with the P4M, a small number of which were purchased in the late 1940s. As the primary mission of the VP squadrons became increasingly devoted to anti-sub warfare, another aircraft class was developed—airborne early warning. These VW types assumed a "patrol" function which once belonged exclusively to VP squadrons.

Latest of the patrol planes is Lockheed's P3V, a big airplane measuring 116 feet from nose to tail cone. However, the wing span is 99 feet, five feet shorter than the span of the famous old PBY of early WW II.

Illustrated changes which have come to patrol planes are take-off horsepower and cruise speed. Total takeoff power of the P3V is 18,000 engine shaft horsepower (E.S.H.P.) while the PBY mustered not much more than 2500 horses. Cruise speed of the P3V is over 300 knots: The "Yokeboat" rocked along at a wing-flexing 130 knots.

While a connection between overweight and aircraft accidents may be hard to prove, statisticians have established a correlation between overweight and shortened life span . . . the hard, lean and physically fit will be around when the fat and sloppy are gone. . . .

OVERWEIGHT

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MENU

USS. CVS-XX—

French Onion Soup
Roast Veal
Grilled Cheeseburgers
Mashed Potatoes
Natural Gravy
Buttered Whole Corn
Buttered F.F. Squash
Salad Bar No. 1
Hot Rolls Butter
Chocolate Pie
Iced Grapeade
Fresh Milk

And this repast wasn't served on a Sunday . . . It was Thursday lunch. Obviously, nobody can contest the fact that the U. S. Navy is extremely well fed.

But good food like this— with all the seconds, thirds and fourths you want—shrinks your uniform and your cockpit, makes you unpopular with your flight surgeon and BuMed when annual physical time rolls around and causes all kinds of complications.

If you are somewhat over Navy standard weight you have company. In 9 percent of the accidents occuring in calendar year 1960, a pilot or crew-member was reported more than 20 pounds over Navy standard for his age and height. The overweight averaged 31.9 pounds per man. And this does not represent all the over-Navy-standard-weight pilots and crewmembers who had accidents because flight-surgeons are not required to report 1 to 19 pounds over standard on MORs.

So what? you ask. As long as you're not over Navy "max," that "over Navy standard" doesn't count. You pass your annual physical, your flight surgeon okays you and the flight pay keeps coming in. And even if you're over Navy "max," you can go on a crash program two weeks before your birthday and get down under. You may be over standard still but you're under max—no sweat.

That's right. Technically, you're in the clear but physically you're doing yourself no favor. Here's why—Navy standard weight is *average* weight, not necessarily *ideal* weight. And according to the latest actuarial statistics on overweight, the best weight for good health and longer life is 20 pounds *under average.*

Some of the most realistic thinkers in the world on the subject of health and longevity are, as you would expect, insurance company actuaries, the experts who calculate insurance risks and premiums. Two years ago, the Society of Actuaries completed a study of mortality experience covering five million policies from 1935 through 1954. Titled *Build and Blood Pressure Study, 1959,* this is the most extensive body of information ever assembled on the effects of overweight on mortality.

Until this study was made, weight tables used by civilian doctors, insurance companies and even the manufacturer of the scales in your corner drugstore were based on a study made 30 some years ago. The new study shows that short and medium height men in the 20s and 30s are now about five pounds heavier. The increase in men's weights at other ages and for tall men has been generally smaller. (In case you're wondering, the ladies weigh less than a generation ago.) The study also shows that between ages 25 and 40 the average man gains 11 pounds.

Considered alone, these facts are interesting but not earth-shaking. However, the study ties weight to life span. "Moderate and marked overweight continues to result in a serious impairment of longevity," as the actuaries put it. For instance, men weighing 20 pounds above average are subject to about 10 percent higher mortality; those 25 pounds above average to 25 percent higher mortality, and those 50 pounds above average, up to 50 or even 75 percent.

(The most overweight pilot involved in a naval aviation accident in 1960 was 55 pounds over Navy standard, 16 pounds over Navy maximum for his age and height. Three others were 45, 44 and 40 pounds over Navy standard. And, Navy standard and maximum allow you plenty of leeway.)

According to the new actuarial study, your "best weight" (taking into consideration individual body frame and other factors) at any age over 30 is about 20 pounds under the average for your height and age. The lowest mortality (or to think positively, the longest life) is shown among people at the "20 pounds under average" level.

Considering the main causes of death among overweights, the actuarial study showed markedly increased mortality in diabetes first and certain digestive diseases such as gall bladder disease as weight increased. As weights increased further, the death rates from heart disease rose sharply.

If these statistics have convinced you that you should knock off a few pounds, *be sure to consult your flight surgeon.* Do-it-alone weight reduction programs can be dangerous for aviation personnel. Pilots and crewmen cannot take appetite-reducing pills or go on liquids and still fly safely.

FIRST TIME

Following an emergency on a high altitude flight, the pilot of an F8U-2N ejected. The fact that he was wearing a full pressure suit turned an otherwise "routine" ejection into a unique experience—the understatement of the month. Here are excerpts from his narrative:

"The indicated airspeed was approximately 250 knots. The aircraft was in a wings-level attitude approximately 10 miles north of Chincoteague. I positioned myself erect with my feet resting on the cockpit deck just aft of the rudder pedals, grasped the face curtain handle and gave a hard pull. Immediately I was aware of a loud explosion and blast of air and knew that at least the initial part of the ejection had been successful. I had the distinct impression of doing a somersault before the face curtain came loose in my hands. Immediately thereafter I was pulled sharply by the main parachute and simultaneously my head was slammed down and into my left shoulder with a terrific jolt. My face was pushed down and to the left and the face seal was pulled diagonally across my mouth and nose, right side high.

"I could see very little of what was going on from this position but did see the seat and other objects falling away from me. The emergency bailout oxygen system was actuated automatically and supplied sufficient oxygen for me to breathe comfortably. I then attempted to get my head free. I felt as though my entire weight was being supported by the pressure suit helmet oxygen hose. I was unable to remove any of the pressure which kept forcing my head into my left shoulder. Since I knew I was at an altitude at which oxygen was not required, I tried to get my pressure suit face plate open but was unsuccessful. After what I estimated to be about two minutes, my bailout oxygen supply ran out and immediately my face plate fogged over. I knew I had to get some air quickly or I would suffocate. Since I had been unable to get the face plate open, I attempted to reach my survival knife, a switch blade model, and cut a hole in my pressure suit. Because of the strain on the pressure suit material which effectively sealed the knife in its pocket on the left upper leg, I couldn't get the knife.

"By this time I realized I was in extremis and numerous uncomplimentary remarks concerning the design of the pressure suit helmet were passing through my mind. I decided my only chance was in getting a glove off and attempting to introduce some air into the pressure suit through the sleeve. I felt along my left arm with my right hand until I located the zipper tab, unzipped it and removed the glove. By holding the sleeve out with my right hand I was able to breathe again.

"After a few breaths I started to work on the helmet again as I expected to hit the water at any instant. I found the neck release ring, unlocked it with my left hand and, placing one hand in front of the helmet and the other behind, began rocking it with all my strength. The neck ring finally separated and I was able to get the helmet off my head and breathe again. I was completely exhausted at this point and relaxed for a few minutes.

"Now that my helmet was off, I could see that I was going to land in Chesapeake Bay and I released the left hip rocket jet fitting to allow my seat pan to hang free. It became apparent at this time that I was drifting fairly rapidly in a northwesterly direction and that I would hit the water facing backwards to the direction of drift. I removed my right glove and dropped it to get some idea of how high I was above the water but I lost sight of it as it passed my feet. I attempted to cross my arms and grab the parachute risers to

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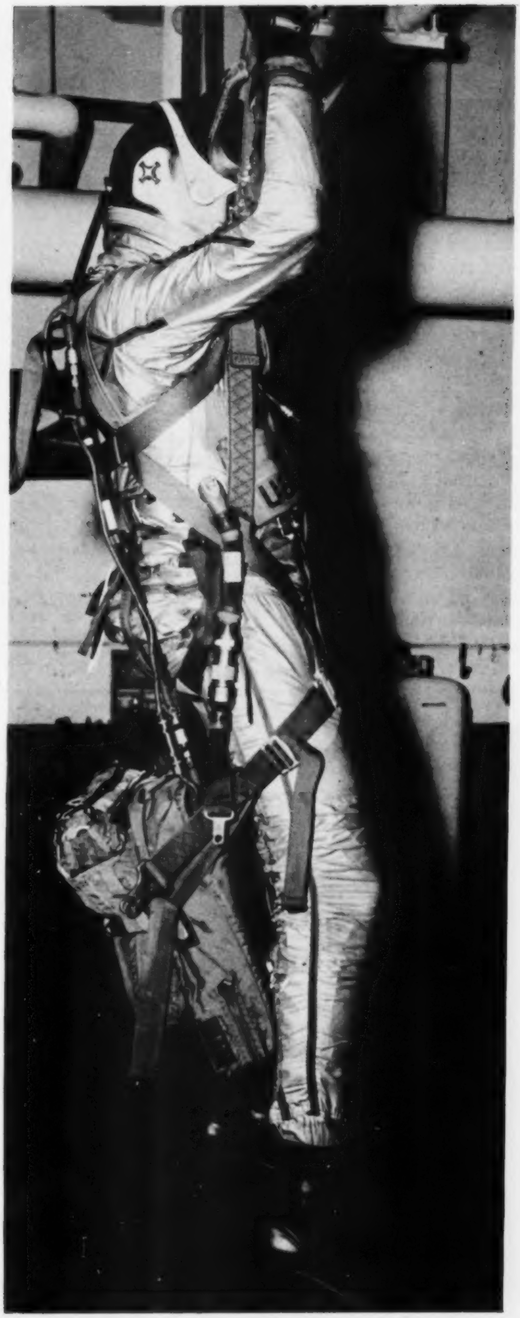
Routing hose over shoulder harness and risers as shown here rotated the helmet to the left on parachute opening.



Routing hose under shoulder harness and parachute risers as shown here will leave the hose free on parachute opening.

turn myself around but didn't have the strength. I decided to conserve my energy in order to free myself from the parachute after I hit the water. I remember thinking that at the rate things were going wrong I would undoubtedly be involved in another flail shortly.

"I placed my hands around the rocket jet fittings on each shoulder and waited to hit the water. I hit with a force much greater than I had anticipated while moving backwards. I was flipped over backwards with my feet coming up over my head and ended up facing the parachute when I came to the surface of the water. My right foot had gone into the center of the parachute shroudlines and was thoroughly entangled in the lines. The chute was half collapsed. I immediately spilled the other half and released the parachute rocket jet fittings. Then I inflated my mae west and attempted to free my right leg from the shroudlines. I soon realized that this would not be possible as the more I attempted to get free, the more entangled I became. I pulled the seat pan over to me, released the rocket jet fitting on my right leg and inflated my life raft. My pressure suit had filled with water at this time through both sleeves and the neck; however, my mae west supported me satisfactorily.

"Climbing into my life raft, I began to untangle the parachute shroudlines from around my right foot. I had almost freed myself when I heard an aircraft. I began to unpack my survival equipment in order to get a smoke flare to attract the attention of the aircraft when I heard a boat approaching.

"A young man had observed my parachute descending while he was sitting in front of a store in Greenbackville, Va., and had run down to his boat and started out after the parachute. As he pulled alongside my life raft, the first thing I saw was a large brown Chesapeake Bay retriever staring at me from the boat. I thought this most appropriate at the time. . . ."

* * *

The pilot sustained no injuries as a result of the ejection except for a stiff neck caused by his head being pushed into his shoulder when his parachute opened. On the morning preceding the flight, he had completed a scheduled ejection seat checkout in the F8U-2N and F9F-8T as required each four months by OpNav Inst 3740.3B. He later commented:

"Needless to say having this check-out in the seats and associated survival equipment approximately five hours prior to ejection gave me a tremendous advantage during this ejection."

Underwater Escape from F4D

THE F4D's port brake failed while the pilot was taxiing the plane after a carrier landing. Although the pilot called for chocks over the radio and motioned the taxi director for chocks, the chocks were not supplied in time.

The plane continued straight ahead, over the edge of the flight deck and into the water in an inverted position. As the tail settled slowly and sank, the plane was in a vertical position with only the nose cone projecting above the surface of the water. Immediately after the plane sank completely, the pilot appeared on the surface and was picked up by the ship's helicopter.

The fact that the pilot finally made his way out of the cockpit is, in retrospect, a very remarkable occurrence.

As soon as the plane hit the water, the cockpit and his oxygen mask filled with water thereby precluding his use of oxygen under water.

He tried several times to find the manual canopy release on the starboard side but was unsuccessful. He did not try the other methods of emergency canopy release.

Due to his inverted position and the bulkiness of the anti-exposure suit, he could not get his fingers between his hardhat and the top of the canopy to pull the face curtain and in that way release the canopy.

As he went for the manual release again he felt the canopy leave the aircraft and he immediately began to ascend. He rose to the surface and with his parachute still attached by the leg straps was picked up by the rescuing helicopter.

The pilot's survival training probably saved his life. Two months prior to the accident, he had practiced escape from the Dilbert Dunker in his anti-exposure suit, experienced parachute drag and practiced maintenance swim. He had also gone through a dummy ejection drill including a blindfold checkout in canopy jettison systems.

Among the reporting flight surgeon's recommendations is that *all pilots accomplish Dilbert Dunker and parachute release drills while wearing their anti-exposure suits.*

SHARK CHASER

Dr. Perry W. Gilbert
Department of Zoology
Cornell University

In experiments the behavior of large captive Lemon and Dusky Sharks (*Negaprion brevirostris* and *Eulamia obscurus*), maintained in an open pen 90′ x 30′ x 8′ deep, was observed over a period of several days before the tests were conducted. The unique clarity of the water made it possible to obtain a good photographic record of the behavior of the sharks before, during, and after the tests.

During the tests a lure, suspended from a long bamboo pole by a line, was presented to the sharks for 10 minutes and the number of deliberate approaches to the lure during this period recorded. After an interval of 15-20 minutes the chemical compound to be tested for its repellent properties was added to the lure and the number of approaches again filmed and counted. The lure alone and the lure plus the chemical were so packaged as to present the identical visual stimulus to the sharks. Fresh beef blood evoked more aggressive behavior than other lures and was used most frequently in the tests. Materials tested for repellent properties included several phenyl acetate compounds, copper acetate, and the U. S. Navy "Shark Chaser." The phenyl acetate compounds, although strongly repugnant to bony fish, failed to evoke a similar response in the sharks tested. Moreover the Lemon and Dusky Sharks readily approached a lure (fresh beef blood) through a cloud of copper acetate. When "Shark Chaser" (copper acetate plus nigrosine type dye), or nigrosine dye alone, was used with fresh beef blood, however, the sharks repeatedly avoided the lure.

For more info on Shark avoidance see APPROACH, March 1961, p. 30.—Ed.

Shark!

Due to engine fire, the pilot of an F3H-2 ejected off the coast of California. He was not able to sit back in the parachute harness sling during parachute descent and consequently was unable to release his pararaft. After entering the water, he freed himself from his parachute, unbuckled his pararaft lanyard and inflated his life preserver vest.

After clearing the parachute, the pilot felt something hit his foot . . . the dorsal fin of a shark appeared about 30 feet away. Scattering shark chaser around him proved effective until a helicopter appeared on the scene shortly afterwards and made the pickup.

FROSTBITE

A PILOT and two crewmen were flying a 4.3 hour high altitude bombing mission in an A3D-2 from a carrier. On climbout, the pilot noted that the air conditioning/pressurization system was not putting out heat in either manual or automatic position. Later it was found that the air conditioning mixer valve was sticking intermittently, shutting off the flow of warm air to the cockpit. He considered aborting the mission, but, thinking the last portion of the hop could be flown at low level, continued. To conserve fuel, however, the entire hop had to be flown at 20,000 feet or above.

The first hour and 45 minutes was flown at 34,000 feet (temperature −45°C.), the next 45 minutes at 31,000 feet (−35°C.), and the remainder at 20,000 (−20°C.) to allow enough fuel reserve for the return to the ship.

The pilot and crewmen were wearing summer flight suits over thin underwear and high top flight shoes over black cotton socks. They did not have leather flight jackets along.

After two and a half hours, all three men were having severe chills and the pilot's legs were numb from the knees down. From time to time, the bombardier-navigator took off his shoes and rubbed his feet and legs to stimulate circulation. He deflected the moving cold air by placing his navigation bag against the outlet on his side. The third crewman who did not have any cold air blowing directly on him was the least affected. The pilot, unable to move his feet and legs to any extent, was the worst off and developed frostbite of the second and fourth toes of his left foot which kept him on the sick list 13 days. The crewmen suffered no ill effects.

Comments reported on the incident:

● Proper cold weather clothing should be worn or carried on all high altitude flights, especially

those of long duration where a failure of the heating system places the airman in an atmosphere of subfreezing weather.

- In order to prevent frostbite, pilot should abort long duration, high altitude missions when the mission cannot be completed at above freezing temperatures.
- The possibility of changing the outlet for the system located near the pilot's and bombardier-navigator's feet or installing a deflector to the outlet should be investigated.

Polar Operations

ON A logistic flight from McMurdo to Byrd Station in Antarctica last winter, an R4D experienced a stall at a low altitude and collided with the snow surface as the pilot was attempting a low visibility approach in a near whiteout condition. Although the aircraft was a strike, the five crewmembers sustained only minor injuries. This can be attributed to the safety equipment and its proper use, the reporting flight surgeon concludes.

However, at the time of the accident, most of the crew were not wearing jackets and coats. The men rapidly abandoned the aircraft following the crash, then seeing no imminent danger of fire, returned to the plane for their jackets.

"It has been emphasized in the past and apparently needs to be reemphasized," the reporting flight surgeon states, "that sufficient clothes should be worn while flying in Antarctica so that the wearer could lie unconscious in the snow for many hours and not freeze."

It is imperative that crewmembers operating in these regions wear their heavy clothing particularly at takeoff and when flying at low altitudes. Standing Operating Procedures may allow heavy outer clothing to be removed while crewmembers carry out their duties when the aircraft is at cruising level well above the terrain or water. Such clothing should be immediately available in case of emergency and regular drills should be held in flight. One cannot expect to survive in these regions without adequate clothing. Cabin temperature should be adjustable so as to provide crew comfort suitable to the clothing being worn.

Seen on Sand

A pilot who ejected from an A4D-2 over the desert collapsed his parachute, spread it out on the sand and sat down on it to await rescue. The parachute—the only "signal" used—provided easy and rapid identification. A helicopter landed nearby and the pilot was picked up and returned to base.

Toggles Secured

A pilot in a water survival situation found himself unable to pull the toggles of his life vest until he took off his gloves. On a previous flight, his life vest had inflated accidentally when the toggles caught on his lap belt. Since that time he had been securing the toggle cords under the flaps covering the CO_2 bottles.

This practice is not advisable. The possibility of inadvertent vest inflation in flight is outweighed by the necessity for quick and easy vest inflation in the water.

Free Ride

A recent safety council meeting brought out an interesting point concerning help provided to a flight deck casualty. In their eagerness to assist an injured buddy, flight deck personnel placed this man in a Stokes stretcher, held him down while he screamed, transported him to sick bay and put him in a rack in record time. Only one error—he wasn't the injured man and nobody would listen to him when he tried to tell them!

—*VF-74 Safety Newsletter*

Signal Mirror

After a series of engine difficulties following a flameout and relight, the pilot of an F3H-2 ejected. Rescue 45 minutes after his successful descent and water entry was directly due to his signal mirror.

As he was settling in his raft, he heard a "prop type aircraft" in the west. He flashed his mirror in the direction of the sound until it disappeared, then resumed bailing his raft. A few minutes later an S2F passed down sun of him. He did not have a signal flare ready so he fired three tracers although he knew they were primarily a night signal. They were not seen.

When he saw the S2F about 5 or 6 miles south of him, he flashed his mirror again. After 10 to 15 minutes, the S2F turned toward him. He kept the mirror on the aircraft until it passed overhead, rocked wings and began to orbit. A helicopter picked him up.

Whacks Stick

AFTER engine failure 12 minutes following takeoff, the pilot of an AD-5Q ditched at an airspeed of approximately 130 knots. His inertia reel was locked but his shoulder harness was slack, allowing his face to strike the stick. Although his visor broke on impact, it saved his eye and protected him from head injury.

MAY-DAY!

WITH six aboard, the HUS-1A was on a flight to San Nicholas Island, 55 miles south of Point Mugu. Preflight had been normal. Weather en route was VFR. When a low haze layer was encountered 10 miles off the coast, permission was requested and received to conduct the remainder of the flight at 1200 feet on top of the haze layer.

The flight continued normally at cruise power until about 1022 when approximately 1½ miles northwest of Santa Barbara Island the engine started to backfire and lose power while emitting puffs of black smoke and a continual stream of white smoke. The pilot checked the engine instruments. Except for the tachometer which fluctuated slightly during the backfiring, the instruments showed normal readings. Immediately, the pilot placed the mixture control in RICH and checked the fuel pump and magneto switch. By this time the engine was completely without power and rotor RPM was decaying so he entered autorotation in preparation for the ditching. Broadcasting "May-day" twice, he switched the IFF to Emergency and instructed the crew to remain in their seats until the rotor blades were stopped after ditching. The sea state was smooth. The aircraft settled into the water with no forward speed and a very light impact. The rotor blades were stopped after impact by use of

the rotor brake.

The raft, a Mk-7 weighing some 100 lbs., was secured to the starboard bulkhead by a troop seat type safety belt passed around it and through the hand grips. The hand grips were pointing toward the inboard of the aircraft. One of the crewmen released the safety belt securing the raft, just as the aircraft heeled over to port. The raft fell to the far side of the aircraft and was carried further aft by the inrushing water. The crewman made two attempts to retrieve it but had to give up in order to escape from the sinking plane. Within 30 seconds of rotor blade stoppage, the helicopter went down. The pilot and observer escaped through the flight deck windows, the other four crewmembers through the starboard cargo hatch.

Once out, the pilot counted heads and the men inflated their life vests. Gasoline spread rapidly on the relatively calm sea. After clearing most of the fuel, the men further inflated their life vests orally. Staying in a group, they headed for Santa Barbara Island at an easy pace.

About 15 minutes after ditching, the survivors saw a T-28 apparently searching for them south of Santa Barbara. One of the men fired a distress signal and the group continued to swim for the island. Between 30 and 40 minutes later, a P2V dropped a life raft near them which they retrieved, inflated and climbed aboard. A short while later, they were picked up by helicopter by means of the sling.

Due to weight limitation, the helicopter took the first four men one by one to the island. Toward the end of the rescue operation, the helo had burned enough fuel to pick up the two remaining men and take them direct to Point Mugu. An Air Force helicopter transported the four from the island. Except for being chilled by their stay in the 59° water, the survivors were none the worse for their experience.

Some aspects of the survival episode were good, others were not. "The fact that all six occupants were able to get out of the plane, get away from the gasoline-covered waters, and be rescued without adverse effects indicates the effectiveness of their training and its application in their performance," the reporting flight surgeon notes. "The skill with which the ditching was accomplished, the judgment in not lighting the flare too soon, the ease with which the recovery by the rescue helicopter was made are all noteworthy."

The flight surgeon has some words about anti-exposure suits:

"In this area, the water temperature is marginal and at the time of the accident it was recorded as 59° F. which according to some instructions dictates the use of an anti-exposure suit. Anti-exposure suits are not generally worn on operational missions at this base because of the hindrance to precision flights and operations, yet all concerned realize that it would be advisable to have the protection against cold water immersion once an emergency develops. It is not new that the most common complaint is that the suits are too bulky and that in the readyroom and cockpit environments the lack of ventilation of the suit compounds the awkwardness by accumulation of body fluids through perspiration. It is obvious that some compromise is desirable. This compromise should be a suit that is of lightweight construction yet one which offers a barrier to the cold water."

Here is what the AAR says concerning improvement of the life raft situation:

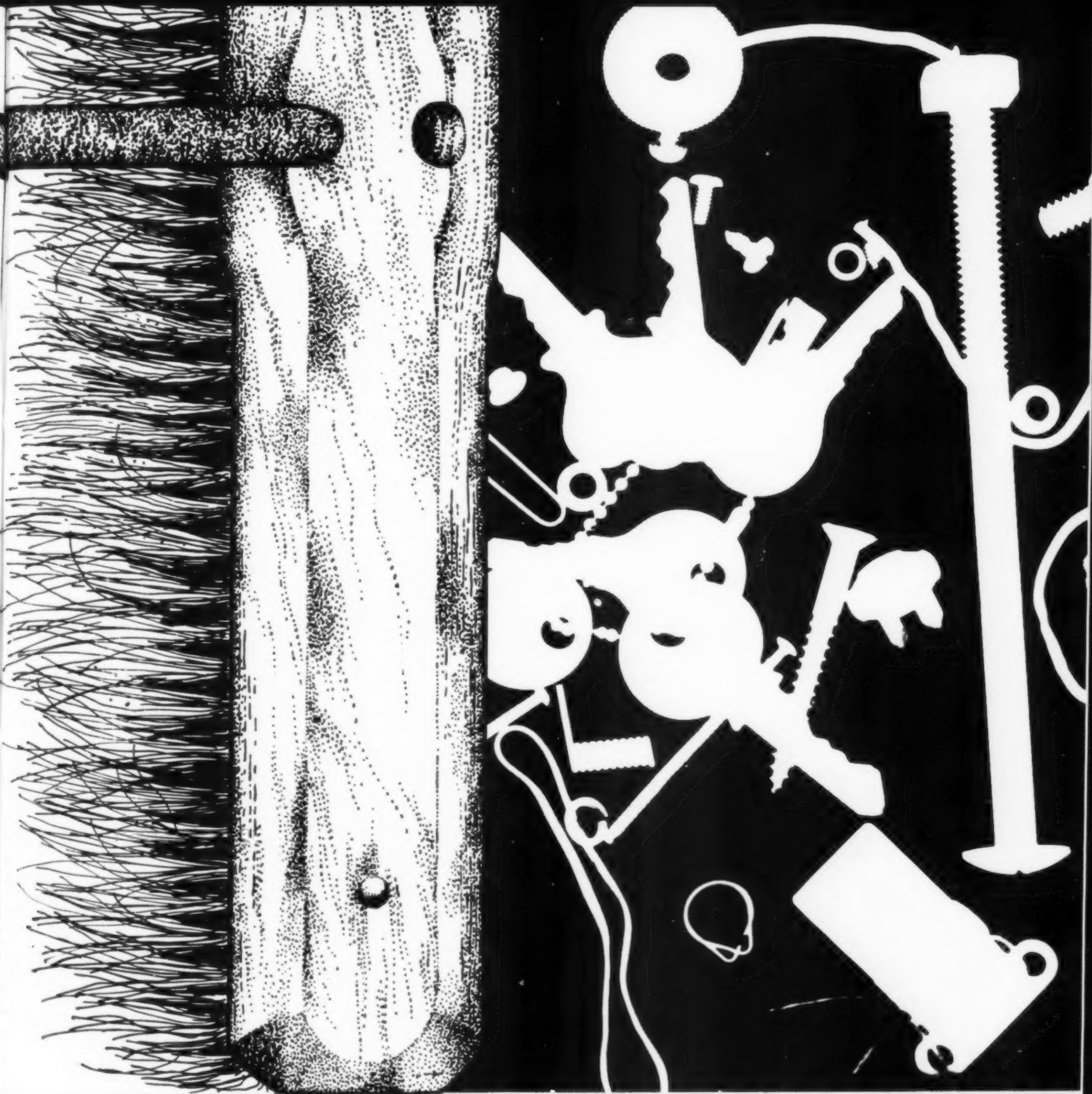
"It is recommended that immediate action be taken by proper authority to improve the method of carrying and insuring proper operation of the life rafts aboard HUS-1A aircraft. A means of external mounting with hydrostatic, electrical and manual operation of raft inflation is necessary. Section VI,3a(3) of OpNav Instruction 3710.7A requires the occupants to remain seated with seat belt, shoulder harness and protective helmets fastened 'until the rotor blades have ceased movement.' Since the helicopter tends to sink immediately (in this case, within approximately 30 seconds) time is insufficient for the life raft to be removed from the craft prior to abandonment."

(*At the time of this writing a project is underway at the Naval Air Material Center, Philadelphia, one feature of which is to develop an externally-mounted hydrostatically releasable life raft. Another feature of the project is to develop emergency flotation gear for helicopters. —Ed.*)

"The pilot and crew's performance during this emergency is considered outstanding," the AAR states. " . . . all personnel involved in the accident contributed to the successful survival of all hands . . . "

REDUCE FOD TO ZERO!

MANY thousands of words have been written and many lectures have been presented on the problem of foreign objects and how they damage the jet engine of today. The proposals and answers to the correction of the problem have always run the same gauntlet, yet, the number of foreign object damaged engines still persists in remaining at an undesirable high. There are instructions on what to do to prevent such damage, orders on the frequency of the "bend-over" campaigns and inspection procedures to be followed prior to starting the engine. Now if the subject is completely covered by existing instructions, how do these same discrepancies still exist. How? By our laxity and complacency. Each squadron by ComNavAirPac instruction is to appoint a Foreign Objects Damage officer whose job it is to see that this type of damage to engines is eradicated in his unit. With all of this insurance there still seems to be a loophole somewhere.



The majority of Foreign Object Damage reports contain the statement that the apron and taxiways are cleaned by a sweeper and vacuum. It does seem rather hypocritical that this remark should be contained in a report setting forth the foreign object damage to an engine. This sweeping and vacuuming procedure may be in effect, but the question arises—how often? Do you have this done by the calendar or by the condition of the aprons and taxiways?

It need not be said that the most effective method is by condition of taxiway and apron. There may be periods of weeks or more when these areas are not in need of a thorough cleaning, yet overnight especially after a high wind, every area, taxiway and runway may need a complete sweeping, vacuuming and hand pickup to remove all possibility of foreign object damage. If your foreign object damage to jet engine report states that you have used sweepers and vacuum, then somewhere along

the line you have failed. Somewhere your procedures are lacking continuity.

In keeping with a persistent effort to remove the need for reports of foreign object damages from units of this Wing, the Chairman of the Maintenance and Material Safety Committee recently directed all Headquarters and Maintenance Squadron Maintenance Officers to submit their ideas and recommendations for counteracting this problem. These lists were turned in and as surprising as it may seem almost all of the recommendations have already been carried in other articles, instructions or lectures on the subject. For general interest and emphasis of the main points, here is how they read:

a. A realistic and consistent technical training program to emphasize the damage various sizes and types of foreign objects can incur in an engine.

b. On-the-job training concerning proper maintenance procedures in order to prevent nuts, bolts, rags, washers and various other bits and pieces from falling into critical areas of the jet engine, installed or uninstalled.

c. Insure use of all protective devices over engine intake and exhaust ports.

d. Training of the plane captains in insuring spacing of aircraft as they taxi into or out of the parking area.

e. More thorough briefing to pilots on proper intervals to be maintained when taxiing.

f. Emphasize a "look down" program to all supervisory and pilot personnel. When foreign objects are noted, schedule a "bend over" campaign as soon as possible.

g. Post large drawings about the working areas listing the cost of replacing the aircraft or engine that is lost due to foreign object damage.

h. Assign supervisory personnel to inspect the adjacent taxiway and apron for foreign objects prior to commencing the day's operations and at noon. It must be emphasized here that there is no limit as to how much debris there may be in these areas; even a little bit is too much.

Although it has been said before, it is worth repeating, that with all of the information now existing concerning foreign object damage to jet engines, we must look elsewhere for the causes. Where to look? In your own backyard. If the information is out, then it is the task of each and every member of the unit to carry out the letter of the law and engage in every possible maneuver to completely halt this type of damage.

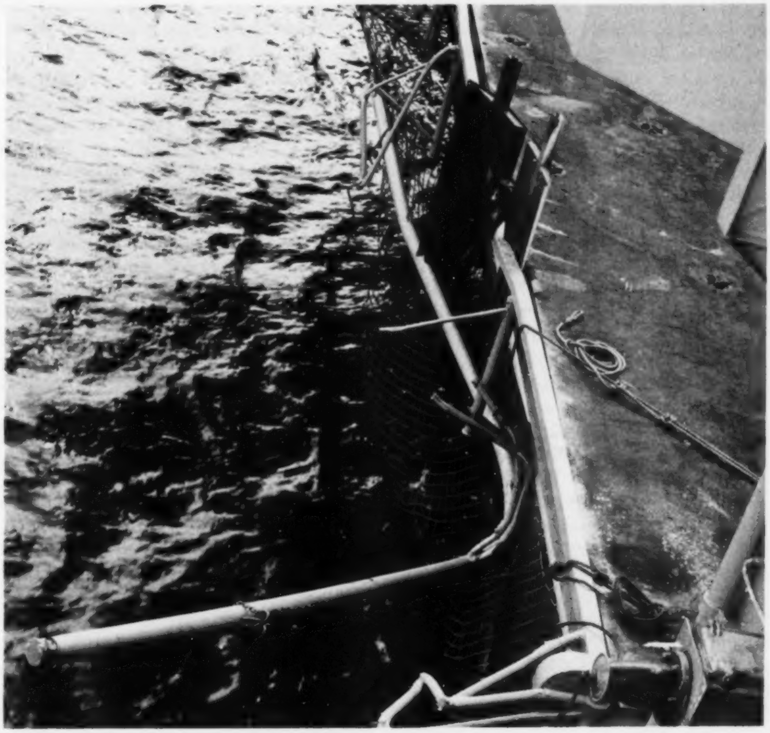
But here again there are a few other views to take on this foreign object damage program. A man from a helicopter unit and another from a piston slapper outfit were overheard bragging that they didn't have this trouble so in effect did not have to comply with all of these directives. It has been found though that these same units have a high rate of personnel injuries and lost time due to hospitalization and "light duty." Yes, we have forgotten one major item in all of our foreign object damage prevention programs—*personnel injury*. An engine can be replaced. When the engine fails, or a turbine blade breaks, it doesn't feel pain. When the engine falls to pieces or is all cut up, there is no anesthesia needed nor is there any recuperation period afterwards. Yet, if a man is hit in the eye, the body, ear, there is pain, possibly the loss of one of his faculties and most assuredly, a period of hospitalization. *Do you have a replacement for him?* If you do, you are far better off than the rest of the Navy.

A flying piece of lock-wire, cotter pin or rock can permanently disable a human, he is lost to the Naval service and on top of that, draws medical disability for the rest of his life. We have lost not only the man but we were not able to fully exploit his knowledge before he was retired. Whose fault was it? It may have been his own for not engaging wholeheartedly in the foreign object program or maybe it is yours for not insisting that he comply.

What are some of these foreign objects concerning helicopters, jet aircraft and reciprocating engine propelled aircraft? Grease on horizontal surfaces, cowling and assorted aircraft parts lying around on the ground, bits of lock-wire, rocks, dust, anything that can be propelled by wind. For those of the uninitiated who can't picture a helicopter causing foreign object injuries let's explain. When those rotating wings start winding up for takeoff or during the approach to a landing, it stirs up all sorts of dirt, rocks, foreign objects in the whirlpool created by the rotor blades. This is when the danger is major. There have been many men laid up for damage to their eyes when a helicopter landed on a filthy apron and blew the dust and small particles of rock into the men's eyes.

Don't say that you have no problem with foreign objects. Every man in the Navy and Marine Corps has the same problem; the only difference is that foreign objects in the field of aviation can and usually do cost more in repair of damages than those found elsewhere. Review your program and find out where you are dropping the ball. Fill the gap and *stop foreign object damage.*

Look at it this way—*for the need of one man stooping to pick up a foreign object, a million dollar aircraft was lost—are you going to pay for it—I should hope to tell you will!!!* Speaking for most men in the service—I don't make the kind of money to pay for this kind of damage when it is so easily *prevented* through a little *tutilage* and *guidance.—3rd MAW*



ROCK and ROLLED

An F8U-2 had been spotted on the number 3 elevator next to an F3H. Its plane captain secured the aircraft with wheel chocks and four tie-downs; two on the nose strut and one from each wing butt. Some 3 hours later he rechecked the position of the wheel chocks and tie-downs and went to the squadron line shack. Shortly thereafter, the flight deck handling crew began preparations to respot the aircraft. In the process of preparing the aircraft for respot all tie-downs were removed, without a brake rider in the cockpit and prior to attaching the aircraft to a tractor. A combination of the rolling motion of the ship and a wet flight deck caused the wheel chocks to slip; allowing the aircraft to roll slightly forward on the port roll of the ship. As the ship rolled to starboard the aircraft moved aft, "kicked-out" the chocks, and rolled over the starboard side of the elevator. Attempts to replace and hold the chocks in place were unsuccessful. No personnel injuries were sustained.

The aircraft sank in 3000 fathoms of water.

The accident board stated a number of circumstances preceded this accident. The flight deck

was wet; the ship was rolling slightly; the tie-downs were removed from the aircraft; there was no "brake rider" in the cockpit; the aircraft was not attached to a tractor; the wheel chocks failed to hold on the wet deck; the aircraft rolled over the side.

Squadron and Ship Instructions are explicit on the duties and responsibilities of a plane captain. The only time a plane captain is permitted to leave the aircraft on the flight deck is during the recovery of aircraft when his aircraft is parked on the starboard side of the flight deck aft of the "Island"—i.e., near the landing area. The plane captain of the F8U fully understood this procedure. The Board is of the opinion that, had the plane captain remained at his assigned duty station, the accident would not have occurred. Therefore, the Board concludes that the action of the plane captain was a contributing factor in this accident.

The plane captain stated he was aware of the fact that plane captains are to remain with their aircraft unless relieved; however, "when I left my aircraft it was blocked by a *Demon* and since it had been spotted on the elevator for almost three hours I did not think they would be moving it in the near future. I am certain that the aircraft was properly tied down when I left it."

The wet deck is considered to be a contributing factor. Had the deck been dry the wheel chocks would, in the opinion of the Board, have held against the weight of the unsecured aircraft. The slight roll of the ship is also considered a contributing factor. Excluding ship's maneuvers, the ship does not normally have sufficient roll to be of any concern in aircraft handling. Under the conditions existing at the time, roll was sufficient to cause the wheel chocks to slip, resulting in the loss of the aircraft.

The Board opined that the responsibility for this accident cannot be placed above the immediate supervisory level. On the day preceding the accident, all squadron plane captains were given a thorough lecture by the Line Maintenance Officer on the squadron SOP concerning plane captains, with particular emphasis on averting a "late in the cruise, go home attitude." Also, during recent weeks, a safety program has been in effect throughout the ship and air group aimed at avoiding a late-in-the-cruise-mishap. It seems reasonable to assume that it is physically impossible for supervisory personnel on the division and/or department level to detect every deviation from standard operating procedures. In this instance, the undetected deviation caused the regrettable loss of a million dollar plus piece of hardware.

Exceptions taken by endorsers of the accident are as follows:

While the presence of an alert plane captain in the cockpit when the tie-downs were removed would certainly have prevented this accident, his mere presence within legal radius of his aircraft would not have so guaranteed. Whenever his plane is securely tied down, the plane captain's presence is required so that the plane may be moved immediately, rather than for security. He is sometimes required to work around his aircraft, he is sometimes permitted to relax in, on or near his aircraft, he is sometimes required to clear the area about his aircraft entirely. Therefore, it is felt that the board's judgment should be modified to read, ". . . had the plane captain remained at his assigned duty station, the accident *might* not have occurred." It is agreed; however, that the action of the plane captain was most probably a contributory factor.

The condition of the flight deck, i.e., wet and rolling, should have made plane handling crews more cautious; however, correction of these conditions was not locally possible. The noted contribution might more properly be attributed to weather phenomena than to "facilities."

In this instance an extensive training program failed to prevent a costly mishap. Each of the men involved deviated slightly from standard procedures; the combined effect of their deviations was the loss of an aircraft.

In flight deck operations, as perhaps nowhere else in naval aviation, many relatively junior men must work rapidly under difficult conditions on a host of different tasks. They are surrounded by danger. Speed and safety are both mandatory requirements, and can only be achieved simultaneously by continuous adherence to carefully devised standard procedures.

The command placed new emphasis on the reasons behind standard deck procedures rather than on repetition of the already mastered procedures themselves. The most junior man must be made aware of the dangers inherent in his routine tasks, and must, under normal circumstances, refuse to deviate from prescribed procedures. All supervisory personnel must be persistently vigilant, and must not condone or ignore detected deviations, no matter how minor the deviation.

Exception was also taken to the statement of the analysis of the Aircraft Accident Board in that this particular ship does not normally have sufficient roll to be of any concern in aircraft handling. Regardless of the size of the carrier, unusual seas have been encountered at unexpected times and flight deck handling crews must be continually alert and not let complacency override good judgment or doctrine while handling aircraft on the flight or hangar deck regardless of the size of the carrier.

Wingfold Signals

The S2F-1 was spotted on the number 3 elevator to have its wingfold/spread system checked. A new wing-lock sequencing valve had been installed in the starboard wing and a hydraulic line to the same valve had been replaced in the port wing. The port engine was turned at 850 rpm to cycle the wings a couple of times before spreading them. The hydraulic mech posted himself at the port wing butt and watched for hydraulic leaks and premature extension of the locking pins. Another mech was stationed at the starboard wing butt to perform the same function.

After the director gave the "spread-the-wings" signal the cockpit man cycled the wings twice. No hydraulic leaks were noted and the locking pins remained in the retracted position. The fold/spread selector was placed in the spread position and the wings were spread. Since only the port engine was turned up that wing reached the spread position first. The starboard wing was almost spread (approximately 10 degrees to go) when the observer saw the locking pins extend. The hydraulics man had moved around the aircraft and was crossing in front of the starboard engine at this time and states that he heard the pins extend. Almost immediately the rear four fold joint lock fittings on top of the outer wing panel contacted the upper locking pins. The wing hinge bolts then sheared and the wing fell with the tip striking the deck (see photo).

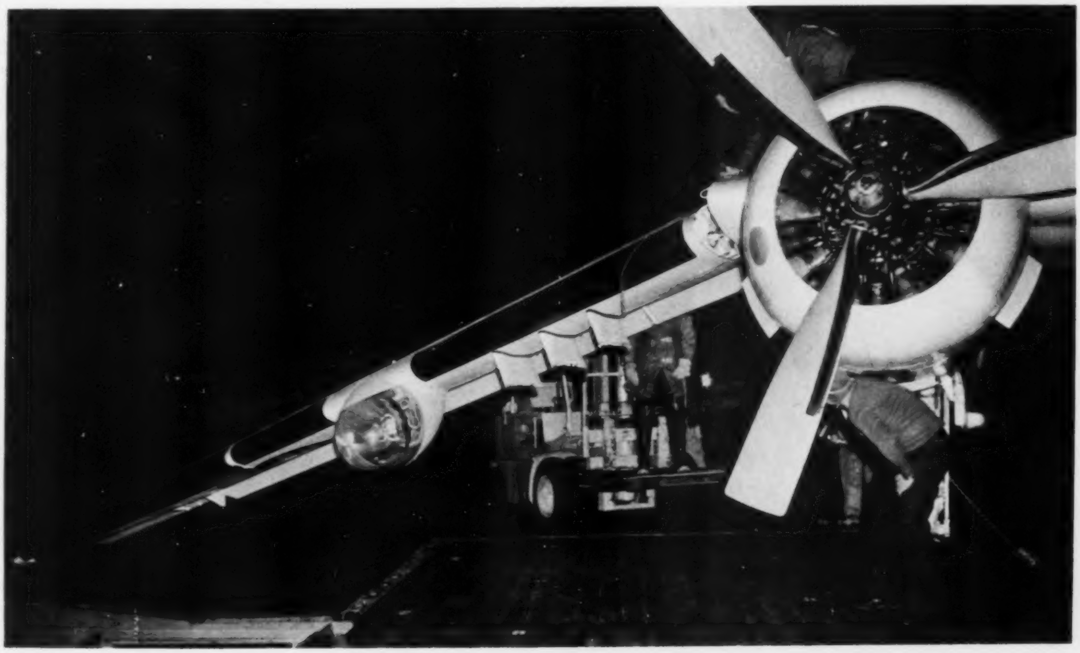
Comments, recommendations and corrective action: Although the precise cause of this incident must await DIR, other related factors have been exposed as deficient. Discussion of these factors, and action relevant to them are as follows:

a. The method employed to alert the man in the cockpit to a malfunction in the lock system was not as certain nor as expeditious as required. (It is noted that almost no system would be quick enough in the event of malfunction with only 10 degrees of spread remaining, as in this case.) Hereafter the wing-watchers will be equipped with whistles to alert the director to signal for a fold operation.

b. The director was not familiar with *why* the wings must be sequenced before spreading. Arrangements will be made to brief appropriate Air Department personnel as to this, and other, special operations relative to the S2F.

c. Squadron experience with similar maintenance operations, delays in obtaining appropriate deck-spot and a desire to place the aircraft in a flyable condition, combined to the end result of accomplishing the inspection under inadequate light conditions. Whenever possible this kind of inspection should be reserved for daylight hours so that a more direct thorough inspection can be obtained.

Continued



Chip Criteria

During straight and level normal cruise at 800 feet the HUP-2 pilot turned downwind, and experienced loss of altitude. He applied power to 42, rpm dropped to 2200 and the magnetic chip detector light came ON. The pilot then entered flat pitch descent losing power, entered full autorotation at 400 feet. The engine quit at 100 feet and the pilot executed successful autorotation to a grass field.

Six weeks earlier during a ferry flight of the same aircraft, a precautionary landing was made following takeoff due to the magnetic chip detector light coming ON. Maintenance personnel from a NAS were flown to the site and inspected the engine. One piece of steel ¼" x ⅛" x 1/32" was found on the magnetic chip detector; however, the amount found was less than that requiring automatic turn-in as directed by GREB 165. No further indications of foreign objects or metal particles in the oil system were found as a result of four 15-hour main oil strainer inspections until examination following engine seizure. It is suspected that the bronze foreign object (photo lower right) was present at this time and became lodged internally until shortly before engine magnetic chip detector light came ON. It then became dislodged and circulated through the oil system causing chipping and subsequent malfunction of the oil system followed by engine seizure.

Recommendations of the accident investigator:

►That all maintenance personnel be continually briefed and cautioned on the results of careless work habits which will cause foreign objects to be dropped or left in engines during buildup and/or inspections.

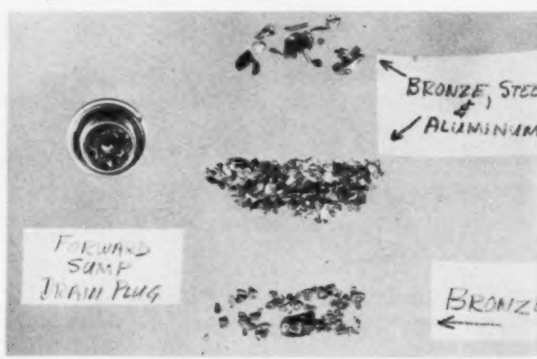
►That when indications of metal particles are found in engine oil systems, extra-precautionary inspections be performed following each flight in those cases where the metal particles are not of sufficient quantity or size to warrant automatic turn-in of the engine in accordance with GEB 165.

The accident board concurred with the comments and recommendations of the investigating officer subject to the following:

►The piece of steel found in the magnetic sump plug earlier was the only indication of metal found in the entire engine. Ordinarily a piece of steel this size would cause considerable concern, but since the aircraft had just completed overhaul, the decision not to change the engine was made. This is considered to have been a logical decision.

►The specific criteria for inspections of engines in which metal is discovered is set by higher authority and field activities must be governed by these. However, each circumstance may have individual aspects which must be considered. Personnel here are well aware that the presence of metal particles in sumps and strainers is generally an indication of impending engine failure. When the decision to continue operation of the engine is made, a certain responsibility for that decision rests with the field activity regardless of the criteria used and nothing prevents the making of extra precautionary inspections to insure the correctness of the decision.

Minute piece of steel in the chip detector below forewarned engine failure.



The Man with the Torque Wrench

Information on torquing and use of torque indicating may sound elementary to the experienced hand. However day after day, it is the so-called experienced hand who goofs up the job by using the wrong tool, or by improperly using the right tool.

Proper use of torque wrenches is an important accident prevention factor. In the past, an appreciable number of accidents resulting from component failures have been traced to the man with the torque wrench. Recent studies revealed that improper torquing of threaded fasteners and fittings. was responsible for an appreciable percentage of service failures of aircraft components.

From stress analysis, etc., it has been determined that *Standard* torque on certain items in certain locations is not sufficient. The Specified torque may be more or less than the Standard value and will almost be spelled out in the text of a publication covering a maintenance procedure. Standard torque values for various size threaded fasteners, which can be found in the NavAer 01-1A-8 publication, are just as important in maintaining the service life and safety factor on a piece of equipment as are the Specified values.

The following irregularities are a few that are most frequently observed:

►Wrenches other than torque handles are sometimes used to tighten threaded fasteners which have torque values specified.

►Extensions used on drive end of torque handle without compensating for increase in leverage.

►Shopmade adapters used with torque handles, thereby destroying the accuracy of the reading.

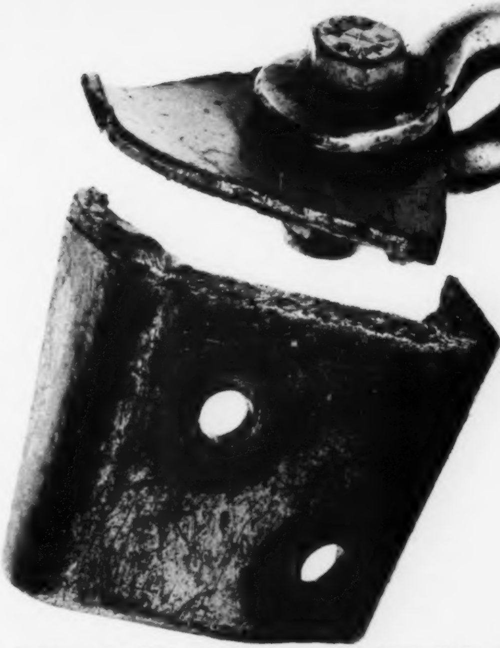
►Torque handles inadvertently dropped and turned back into the tool crib without advising what has happened.

►Torque handles used as hammers, crowbars and other purposes for which they were not designed.

►Torque handles not inspected, repaired and calibrated in accordance with publications and directives covering same.

►It behooves the experienced hand, as well as the inexperienced, to follow the instructions provided for a particular maintenance job, thereby further eliminating the possibility of *HE* (being the man with the torque wrench) trying to explain what happened.

A faulty and/or incorrect maintenance procedure is the forerunner of a mechanical failure.—HU4 "Ruminator"



Engine sling fitting failure prompts thorough inspections of slings.

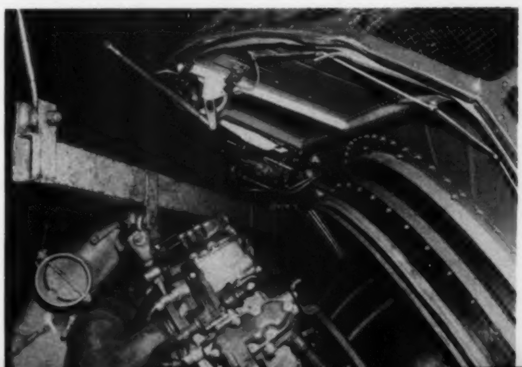
Sling Test

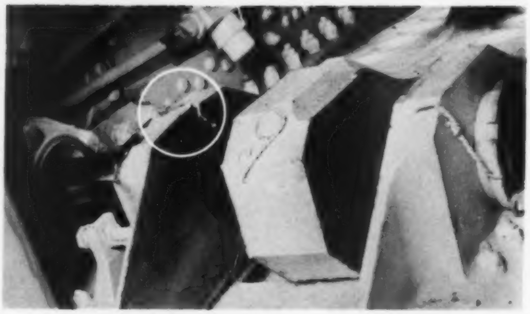
While in the process of installing the engine into the HSS-1 aircraft, the lower port fitting of the engine sling, part no. S1670-10397-1, parted at the welded joint. The engine was prevented from falling by the upper port retaining bolt which had just been inserted; however, the tension on the engine sling caused the lower cross bar to move up rapidly and contact the former ring on the port side of the canted bulkhead causing minor damage.

Comments: Had the engine upper port retaining bolt not been installed, possible damage to the engine and injury to personnel could have resulted.

Recommendations: That a periodic inspection of the engine sling by O&R or other qualified facility be established as standard procedure. In addition, that a visual inspection be made at the squadron level prior to each use of the sling.

Continued





Wingfold spar cap failure—the result of a hurried job.

Haste Makes . . .

Postflight inspection of an A3D-2 after a late evening recovery revealed two broken wingfold attach fittings. After engine shutdown repairs were commenced and the wingfold actuating cylinder was removed.

At 0100 it was decided to spread the starboard wing using the flight deck crane. The starboard wing was spread and then the port wing was spread using hydraulic pressure. During the time hydraulic pressure was up, the forward locking pin in the starboard wing entered the spar cap approximately ¼ inch. With hydraulic pressure up, a leak was found in the starboard wingfold area and it was necessary to fold the starboard wing to repair the leak. The flight deck spot and non-availability of the flight deck crane necessitated the use of the forklift. The wing appeared to commence folding. A loud shot-like noise was then heard which was caused by the spar cap cracking.

Maintenance personnel working on the starboard wing did not visually ascertain that the wing locking pins were fully retracted prior to attempting to fold the starboard wing by using the fork lift.

Comments and Recommendations of the Board:

At the time the spar cap was cracked it was dark, raining, a moderate sea state was running and the wind over the deck was 30 to 35 knots.

The maintenance crew was trying to have the aircraft ready for a 0651R launch. Special weapons were being loaded in adjacent aircraft and this aircraft was scheduled to be loaded at 0400R. Operational requirements called for a 100 percent launch of A3Ds. ADs were being launched at 0515. The foregoing, while not considered a direct cause of the ground accident, indicates the circumstances under which the maintenance crew was working.

Normally a repair of this nature would have been accomplished with the aircraft spotted behind the island. During the work performed on the aircraft it was spotted in the middle of the flight deck.

It is strongly recommended that ideal conditions prevail when attempting to fold or spread wings by use of the flight deck crane. Ideal conditions are considered to be during daylight hours, with minimum wind, the aircraft spotted behind the island and using the flight deck crane instead of a fork lift.

It is further recommended that maintenance personnel remove the link assemblies and all attached fittings of the wingfold actuating cylinder prior to folding or spreading wings by using an external force.

An endorser of this accident wrote:

The cost in man hours required to repair the result of personnel error emphasizes once again the false economy of short cuts to sound maintenance procedures.

Why is it that we never have time to do the job right the first time, but always the second time?

Lost and Found.

Bucking Bars No Sport

In the process of a major check a bucking bar was found within the starboard wing structure of an A4D. It was lying loose within the wing compartment containing the starboard aileron bellcrank and starboard outboard slat track.

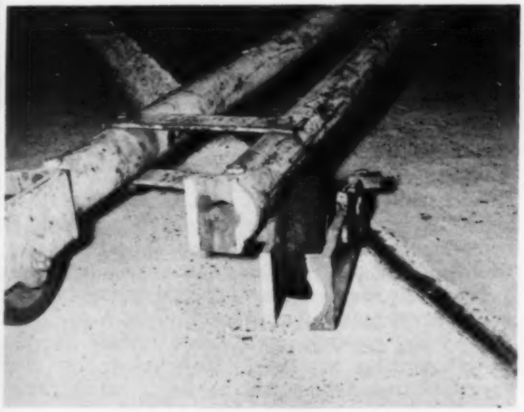
Although the aircraft history revealed no malfunction as a result of the presence of this bar, it is considered that it could have caused restricted movement of the ailerons or starboard slat at anytime. Such restriction could well have resulted in a fatal aircraft accident.

Recommendations.

►That maintenance activities review their procedures in regard to tool accountability.

►That missing tools be reported and a thorough search be undertaken of aircraft undergoing maintenance at the time in question to prevent recurrence of such dangerous situations.

It is a matter of record that maintenance errors whereby tools are left adrift during aircraft maintenance and/or rework have caused tragic loss of both life and aircraft. Elimination of costly occurrences of these types can be expected only after complete implementation of aggressive, unrelenting, quality conscious indoctrination programs for shop personnel augmented by close and meticulous supervisory and quality control attention.



TOW BAR FAILURE—Universal tow bar broke causing F9F-8 to collide with tow tractor. When the tow bar failed the aircraft brake rider did not apply the brakes in sufficient time to prevent the accident. Daily inspection of tow bars is recommended.

Crunch Prevention Record

It is enthusiastically noted that during this cruise and prior to this accident, the Hangar Deck Crew of the USS LAKE CHAMPLAIN completed 2406 consecutive aircraft moves without an accident. Prior to that they had completed 1987 consecutive accident-free aircraft moves. This record makes it apparent that the personnel concerned are safety conscious.

First Endorsement: The fine "no crunch" record of the aircraft handling crews of the USS LAKE CHAMPLAIN indeed shows the measure of safety interest displayed by all hands. The teamwork required between ship's aircraft handlers and the squadron plane captains and brake riders will continue to be a subject for repeated emphasis by this command. Absolute teamwork and mutual trust and confidence between personnel can reduce handling accidents.

Second Endorsement: This accident occurred at 2325 after 48 hours of continuous operations. It is felt that overconfidence and laxness could be a result of fatigue, further complicated by incomplete night adaptation.

Red lights have been installed in the crew's shelters, proper night adaptation procedures have been restressed and the crews have been impressed with the hazards resulting from fatigue. In addition an extra safety man is being used during all night operations.—*From a Ground Accident Report*

Count the Blade Boots

After a normal preflight and engine warm up an attempt was made to engage the rotor system of a HUP-2. A cyclic control displacement was felt by the pilot followed by a grinding noise from the aft portion of the aircraft. The pilot then disengaged the friction clutch and secured the engine. An inspection revealed a broken aft rotor blade.

The friction clutch was energized with one rotor boot still in place breaking off one aft rotor blade four feet from the rotor head.

The plane captain and the pilot made a normal preflight inspection using red lens flashlights; both failed to see the remaining attached rotor boot.

Recommendations:

►That pilots and crew men be re-instructed on the necessity for a complete and thorough preflight of an aircraft.

►That the HUP pilots always count the blade

boots prior to engine runup.

►That the rotor blade boots be connected by a light line into two sets of three.

►That the lines leading to the boots, in addition to being tied together, carry a red streamer midway between the boot and the tiedown point.

Adrift Articles

During an aircraft investigation, a cannon plug to bullpup control was found wedged in the throttle quadrant preventing the pilot from reducing the throttle below 75 percent; the cannon plug was not stowed in storage receptacle.

Aircraft with many interchangeable components for use with varying ordnance configurations are highly susceptible to this type error. However, housekeeping practices that permit tools, flashlights, candy bars, wiping rags . . . , to be left adrift in the aircraft also create a serious accident hazard.

Maintenance personnel must be constantly aware of the serious consequences that may result from practices that permit conditions cited above.

Stress Corrosion Cracks

A recent A3D aircraft incident involved a one-wheel-up landing because of jamming of a wheel by a landing gear door. The landing gear door failed because of stress corrosion cracks in the hinge fitting. This incident emphasizes the need to insure that all critical fittings installed in exterior locations are free from stress-corrosion cracks. The requirements therefore in BuWeps speedletter RRMA-24:SG/128 of 11 August 1960 are mandatory for all PAR aircraft.

Do Unto Others . . .

This article, although commenting generally on one particular occurrence, wherein an aircraft encountered mechanical difficulties while engaged in a ferry flight, is concerned with all aircraft involved in a change of reporting custodian and ferry flight. The aircraft involved in such transfers vary from new models to aircraft that have reached their useful service life. These aircraft, although of various types, models and age should, if flight is involved, have one item in common—*air worthiness.*

The mechnical difficulties encountered on the first leg of a recent ferry flight began with an unsafe landing gear indication and after landing the pilot requested maintenance assistance. During the normal period of consultation with maintenance personnel, the pilot reported that higher than normal engine temperatures were also encountered. The cause for the elevated temperatures was investigated and a number of other serious discrepancies were readily observed. Due to the seriousness of the discrepancies it was determined that an intermediate inspection should be performed to insure that the aircraft was air worthy. Fifty major and minor discrepancies were corrected during the inspection and included items such as broken exhaust stack clamps, loose electrical leads, oil leaks and broken hydraulic lines.

The commanding officer of the station repairing the aircraft reported that the transfer check had been inadequate, and further, that the pilot's preflight inspection could not be expected to uncover the discrepancies found on the aircraft. It was the opinion of the C.O. that the discrepant exhaust system allowing hot exhaust gases into the immediate area of numerous oil leaks created conditions which could have resulted in an engine fire and possibly an aircraft accident.

Aircraft accidents and incidents which have occurred while the aircraft was in a ferry status were reviewed by the Aviation Safety Center to determine what cause factors were most prevalent in these occurrences. The period considered was 1 July 1959 through May 1961. Material failure/malfunction and other personnel were found to be two of the most common cause factors for the 81 occurrences reviewed. Material failure/malfunction was determined to be a cause factor for 12 of the aircraft accidents and 24 of the incidents. Material failures/malfunctions induced by personnel other than the pilot was a causal factor in 12 additional instances. All involved aircraft in a ferry status and as such had recently been subjected to an extensive inspection as prescribed by BuWeps Inst. 3700.3A. In addition, a test flight had been performed prior to transfer from the reporting custodian; thus acceptable material condition and proper operation of all systems should have been assured.

Conscientious performance of the Minimum Operating Requirements for aircraft to be ferried (BuWeps Inst 3700.3A) and correcting of all known discrepancies on aircraft to be transferred should warrant the same serious consideration and effort as readying an aircraft for any flight mission. Furthermore, it will insure that the ferry crew will not be subjected to hazards over which they have little or no control. In addition, the accepting activity can feel assured that the material condition of the aircraft received is acceptable and the receipt of same will not be just an additional maintenance burden.

Murphy's Law*

HSS-1

FROM scared squadron test pilot.—The HSS-1 out of major check, preflight and Anti-sub equipment check. Good takeoff from carrier deck and aircraft momentarily went "ape." Overcame ASE with considerable control displacement and rudder pressure. Release ASE o.k. Trouble—roll and yaw motor plugs interchanged in motor box sockets. Squadron now color codes roll-pitch and yaw plugs and sockets with bright red white and blue paint.

TEST PILOT MOUSE

SNB

FOLLOWING starboard engine change, inspection and test flight, this SNB was released for cross-country flight to Jacksonville. Upon return to this base the pilot reported the port manifold pressure indicator as sluggish. Investigation showed that the manifold pressure line and the primer line were reversed at the firewall.

—Contributed by Anymouse

F8U-2

ON A test flight after par the F8U-2 pilot reported insufficient oxygen flow on ground check. Indication was lack of the characteristic sizzling noise. Inspection revealed pilot's supply line connected to buildup side pressure opening and closing valve. Vent and buildup lines were connected to pilot's supply connection. Inspection of all F8U O&Rs revealed two additional aircraft with same discrepancy—one aircraft in process, one just received from operating activity.

With lines crossed pilot's oxygen supply is dependent upon pressure generated in converter. Normal buildup cycle inoperative. Duration supply unpredictable.

Recommend immediate inspection all F8U for proper connection pilot's supply and vent and buildup lines at pressure opening and closing valve. Figure 4-8, page 4-32 of HMI typical.

Recommend design change flexible pilot S supply line from number 4 to number 6 to preclude misconnection.—*NAS NorIs msg. 052142 Jan 61*

S2F/TF

S2F/TF wingfold cylinder assy. part number 89H1056, FSN RH1650-305-4398 AGRA was designed and procured under both the early and later MIL-H-8775A (ASG) specification. The earlier specification does not require permanent port marking to prevent reverse connection.

Therefore, BuWeps has requested that ASO (SCX) schedule the subject cylinders having the non-permanent markings, not to interfere with fleet logistic support, through the local O&R for verification of correct port labeling.

It is further requested that the processed and correctly labeled cylinders be identified by painting a ½ inch red dot overlapping the edge of the label/body for quick installation identification.

—FWAE-242-JLB/134 Spdltr 30 Dec 1960

* *If an aircraft part can be installed incorrectly, someone will install it that way!*

CLIPBOARD

Trust not the seat of the pants nor the devil in thy soul, but follow thine instructions.
—RCAF "Flight Comment"

"Hot" Windshield

THE following came to us from FSF's West Coast manager: "The steel windshield structure of a jet transport recently was highly magnetized by lightning. The steel is SAE 4130 heat-treated to high tensile strength. At the time of my visit, no way had yet been found to de-magnetize the windshield frame structure which in plan-form and when magnetized is a horseshoe-shaped magnet with compasses and other magneto-electrical instruments in its magnetic field. The auxiliary compasses, used as stand-by and required as emergency equipment, were completely disrupted in their readings by the windshield frame's magnetic field." *—FSF Bulletin*

Safety Matches

SAFETY matches may be ignited by either friction, an external source of heat (350°F or over) or static electricity. Occasionally this may happen in baggage when more than one book is carried and having been jostled around an open book is rubbed against the striking strip of another.

Infrequent incidents are on record where this was the source of ignition in a smoldering bag or briefcase. Crews are cautioned against carrying match books in their luggage or briefcases.*—TWA Flite Facts*

Overheard Over Morning Coffee

Harassed pilot-husband explaining a "Round Robin" to confused wife: "It's this way dear, we're going to be gone a long time but we're not going anywhere."

Training Aid

OFTEN instructors in on-the-job-training or school classes need a training aid to make a point clear. While you labor solely with words, that "unavailable" training aid may be only a few blocks away. A trip to your nearest salvage yard might uncover a virtual treasure of training aids.*—U. S. Army Aviation Digest*

Answer to Quiz, page 21

1. d. The partial pressure of oxygen decreases
2. a. Vision
3. a. Reduction in CO_2 partial pressure of the blood
4. d. Carbon dioxide in your blood
5. b. Eat a normal amount of food that agrees with you
6. d. A sighting of enemy or unfriendly aircraft, ship, or submarine
7. b. False
8. b. 350
9. b. False
10. c. 300 and 1

How Long Does It Take?

It takes a minute to write a safety rule.

It takes an hour to hold a safety meeting.

It takes a week to plan a safety program.

It takes a month to put it into operation.

It takes a year to win a safety award

It takes a lifetime to make a safe worker.

It takes one second to destroy it all with one accident.

—Safety Information

Accident Prevention

AS STATED previously we much prefer to devote our activities to accident prevention, rather than accident investigation. Fortunately, we have been able to do this. We feel the greatest safety device known is the pilot-in-command. He must continually be of a state of mind that he is *willing* to do those things he knows are necessary to effect a safe operation. Each pilot-in-command has demonstrated he knows the basic requirements of his flying job—the ultimate basic requirement being to know the machine and the prescribed rules of operating it. The next most basic is to follow those rules. This secondary requirement requires a state of air discipline which is achieved neither through excessive FAA Regulation and enforcement or excessive company regulation, supervision, and discipline. The pilot has to be safety conscious and apply "air discipline" to his thoughts and actions. The Air Dictionary defines "air discipline" as "compliance with the systematic rules and procedures adopted or used in handling or operating aircraft."*— ALPA Tech "Talk"*

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CHIEF OF NAVAL OPERATIONS SAFETY AWARDS

Winners

VF-14	VMA-231	VR-21	VT-22
VF-103	VAH-2	VMR-252	VT-31
VF-725	VA-126	VR-742	VT-4
VMF-451	CVG-6	VW-11	VT-3
VMA-233	VP-4	HS-5	CIC School Glynco
VA-83	VP-741	HMR(L)-263	HU-2
VMA-214	VP-45	HMR-772	VF(AW)-3
VA-65	VS-29	HU-812	HU-1
VA-672	VS-741	H&MS-13	

Runners-Up

VF-151	VA-52	VP-42	HS-4
VF-24	VAH-7	VS-34	HMR(L)-261
VMF-333	VF-174	VR-1	H&MS-32
VA-94	CVG-9	VMGR-352	HU-4
VMA-332	VP-5	VW-1	VQ-2
VAW-13	VMCJ-2	VMO-6	

Special Awards

USS ANTIETAM — HMR(M)-461 — HT-8

Flatley Awards

CVA	CVS
USS INTREPID	USS RANDOLPH

SCARF and JODPHURS

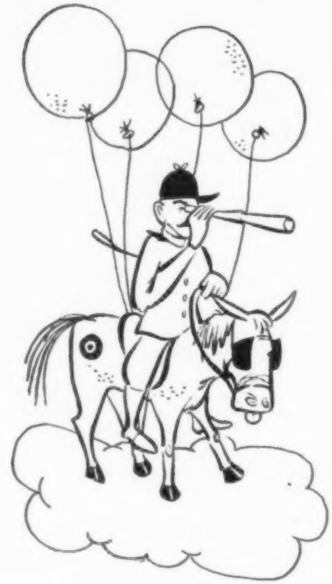
Every once in a while we read something about the "good old days" of flying which sounds wonderful (and sometimes humorous). In any field of human endeavor we must start with curiosity and honest ignorance and struggle forward from there. With this in mind, read the following excerpts from the Royal Flying Corps (forerunner of the RAF) monthly report of December 1917 and judge for yourself how much some of us have progressed.

Another good month. In all a total of 35 accidents were reported, only 6 of which were avoidable. This represents a great improvement over November, when 84 accidents, 23 avoidable, occurred.

Resume Avoidable Accidents

A *B.E. 2* stalled and crashed during an artillery exercise. The pilot had been struck on the head by the semaphore of his observer who was signaling to the gunners.

A *Longhorn* pilot lost control and crashed in a bog near Chipping Sedbury. There was an error of skill on the part of the pilot in not being able to control a machine with a wide speed band of 10 mph between top speed and stalling speed.



Accident Briefs

No. 847 Squadron—19 December 1917
Spotter Balloon—J. 17983
Capt. L de Courcy-Bass
Total Solo—107.00
Solo Type— 32.10

Capt. de Courcy-Bass of the Hussars, a balloon observer, unfortunately allowed the spike of his full-dress helmet to impinge against the envelope of his balloon. There was a violent explosion and the balloon carried out a series of fantastic and uncontrollable maneuvers, whilst rapidly emptying itself of gas. The pilot was thrown clear and escaped injury as he was lucky enough to land on his head.

Remarks

F. 1022 action has been taken. The pilot was flying in full dress uniform because he was officer of the day. In consequence it has been recommended that a pilot will not fly during his duty period.

Capt. de Courcy-Bass has requested an exchange posting to the Patrouille d'Alpes, a well known mule unit of the Basques.

A Guide to the Elements

Many weather maxims have been handed down to the present generation. These rhymes have some truth in them for they are honest expressions of men who have had life-long experience with the weather and its variableness.

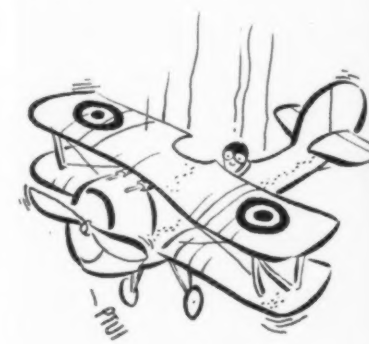
"Long foretold, long last
Short foretold, soon past."

"If hoar frost comes on morning twain
The third day surely will have rain."

Unavoidable Accidents

The top wing of a *Camel* fell off due to fatigue failure of the flying wires. A successful emergency landing was carried out.

Pigeons destroyed a *Camel* and two *Longhorns* after mid-air strikes.



Flying Safety Tips

Horizontal Turns—To take a turn, a pilot must always remember to sit upright, otherwise he will increase the banking of the aeroplane. He should never lean over.

Engine Noises—Upon the detection of a knock, grind, rattle or squeak, the engine should be at once stopped. Knocking or grinding accompanied by a squeak indicates binding and lack of lubricant.

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